

4

Hindu Temple Design within the four sided Mandala



Dr Uday Dokras

Evolution of the Hindu temple Design under the parameters of 4 sided MANDALA (shapes)



4

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INTRODUCTION



Sacral architecture or **religious architecture** is an architectural practice concerned with the design and construction of places of worship or sacred or intentional space, such as temples or Mandirs as they are rightly called, churches, mosques, stupas and synagogues. Many cultures devoted considerable resources to their sacred architecture and places of worship. Religious and sacred spaces are amongst the most impressive and permanent monolithic buildings created by humanity. Conversely, sacred architecture as a locale for meta-intimacy may also be non-monolithic, ephemeral and intensely private, personal and non-public.

Sacred, religious and holy structures often evolved over centuries and were the largest buildings in the world, prior to the modern skyscraper. While the various styles employed in sacred architecture sometimes reflected trends in other structures, these styles also remained unique from the contemporary architecture used in other structures. With the rise of Christianity and Islam, religious buildings increasingly became centres of worship, prayer and meditation.

The Western scholarly discipline of the history of architecture itself closely follows the history of religious architecture from ancient times until the Baroque period, at least. Sacred geometry, iconography, and the use of sophisticated semiotics such as signs, symbols and religious motifs are endemic to sacred architecture.

Sacred architecture spans a number of ancient architectural styles including Neolithic architecture, ancient Egyptian architecture and Sumerian architecture. Ancient religious buildings, particularly temples, were often viewed as the dwelling place, the *temenos* of the gods and were used as the site of various kinds of sacrifice. Ancient tombs and burial structures are also examples of architectural structures reflecting religious beliefs of their various societies. The Temple of Karnak at Thebes, Egypt was constructed across a period of 1300 years and its numerous temples comprise what may be the largest religious structure ever built. Ancient Egyptian religious architecture has fascinated archaeologists and captured the public imagination for millennia.



What are the three rules of architecture?

These universal principles of good architecture: **Durability, Utility and Beauty**, can help us all be better at what we do. **Seven principles encompass an interesting design.**

- Balance.
- Rhythm.
- Emphasis.
- Proportion and scale.
- Movement.
- Contrast.
- Unity.

What are the 5 principles of architecture?

The 5 Points of Modern Architecture in Contemporary Projects

- Pilotis. Lifting a building over pilotis frees the ground floor for the circulation of people and vehicles. ...
- Free Design of the Ground Plan. ...
- Free Design of the Facade. ...
- Horizontal Windows.

'The Five Points of a New Architecture' (1927)

- Pilotis. Replacement of ground floor supporting walls by a grid of reinforced concrete columns that bear the structural load is the basis of the new aesthetic.
- The free design of the ground plan. ...
- The free design of the façade. ...
- Horizontal windows. ...
- Roof garden.

What is the golden rule in architecture?

One of the simplest ways to impart a sense of balance to a structure is to base it off the principles of the golden rectangle. To explain it simply, a golden rectangle signifies any shape that can be wholly divided into up into a square and a rectangle that, when combined, establish a ratio of 1:1.61.

Hindu sacral temple architecture is based on *Sthapatya Veda* and many other ancient religious texts like the *Brihat Samhita*, *Vastu Shastra* and *Shilpa Shastras* in accordance to the design principles and guidelines believed to have been laid by the divine architect Vishvakarma. It evolved over a period of more than 2000 years. The Hindu architecture conforms to strict religious models that incorporate elements

of astronomy and sacred geometry. In Hindu belief, the temple represents the macrocosm of the universe as well as the microcosm of inner space. While the underlying form of Hindu temple architecture follows strict traditions, considerable variation occurs with the often intense decorative embellishments and ornamentation.



Top 8 architectural styles that can easily be recognized

Indian architecture is related to the history and religions of the time periods as well as to the geography and geology of the Indian subcontinent. India was crisscrossed by trading routes of merchants from as far away as Siraf and China as well as weathering invasions by foreigners, resulting in multiple influences of foreign elements on native styles. The diversity of Indian culture is represented in its architecture. Indian architecture comprises a blend of ancient and varied native traditions, with building types, forms and technologies from West, Central Asia, and Europe.

- Greek and Roman Classical Architecture. ...
- Gothic Architecture. ...
- Baroque. ...

- Neoclassical Architecture. ...
- Victorian Architecture. ...
- Modern Architecture. ...
- Post-Modern Architecture. ...
- Neofuturist Architecture.

What are the 7 concepts of Hinduism?

This article explains the Hindu concepts of **Atman, Dharma, Varna, Karma, Samsara, Purushartha, Moksha, Brahman, Bhagavan and Ishvara**.

What are the 3 major concepts in Hinduism?

Common to virtually all Hindus are certain beliefs, including, but not limited to, the following:

- a belief in many gods, which are seen as manifestations of a single unity. ...
- a preference for one deity while not excluding or disbelieving others.
- a belief in the universal law of cause and effect (karma) and reincarnation.

What are the 3 types of architecture? The 3 basic components of the Hindu temple?

Mandapa or the portico which leads to the garbhagriha, where the worshipers assemble. Shikhara that is the spire above the sanctum. Vaahan which is the mount or vehicle of the main deity of the temple.

Three main styles of temple architecture are **the Nagara or the Northern style, the Dravida or the Southern style and the Vesara or Mixed style**.

What are the three main styles of temple architecture?

What are the major styles of Indian temple architecture? The two major styles of temple architecture in the country are known as **Nagara in the north and Dravidian in the south**. The third style, Vesara Style, is fusion of Nagara and Dravidian style of architecture.

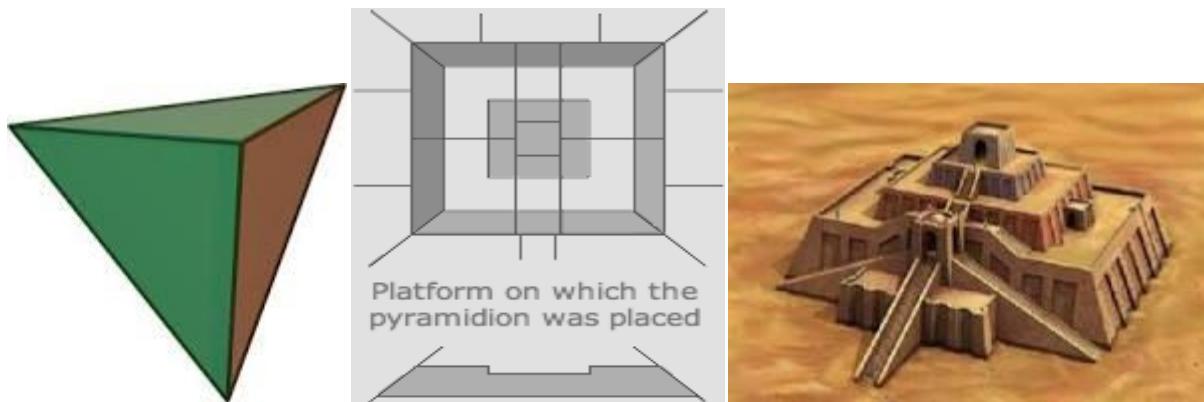
How square are the pyramids?

Example of other 4 sided plans



Scientists have concluded that the base of the Great Pyramid of Giza is lopsided, due to a mistake made by builders during its construction. The west side of the Pyramid is slightly longer than the east one. This is because **the base is not square**, with one side 14.4 centimetres longer than the one opposite it.

What is a 4 faced pyramid called?



The Site

Tetrahedron

In geometry, a **tetrahedron** (plural: **tetrahedra** or **tetrahedrons**), also known as a **triangular pyramid**, is a polyhedron composed of four triangular faces, six straight edges, and four vertex corners. The tetrahedron is the simplest of all the ordinary convex polyhedra and the only one that has fewer than 5 faces. A triangular pyramid is a geometric shape that has a triangular base and three triangular faces. It has a vertex, common to all the three lateral faces of a triangular pyramid. If all the three triangular faces are equilateral, then such a pyramid is called a tetrahedron. 10-Jul-2020

What is a 6 faced pyramid called?

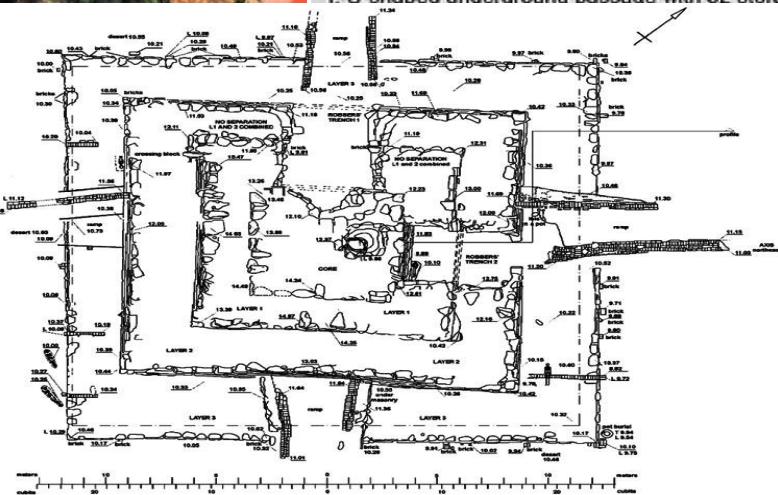
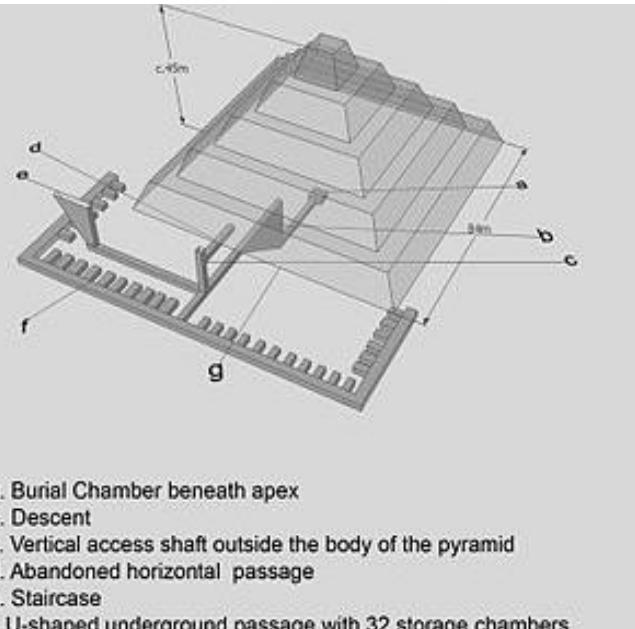
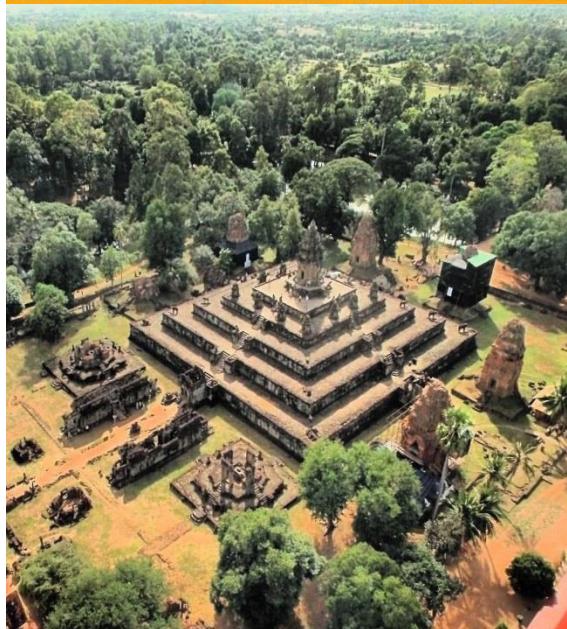
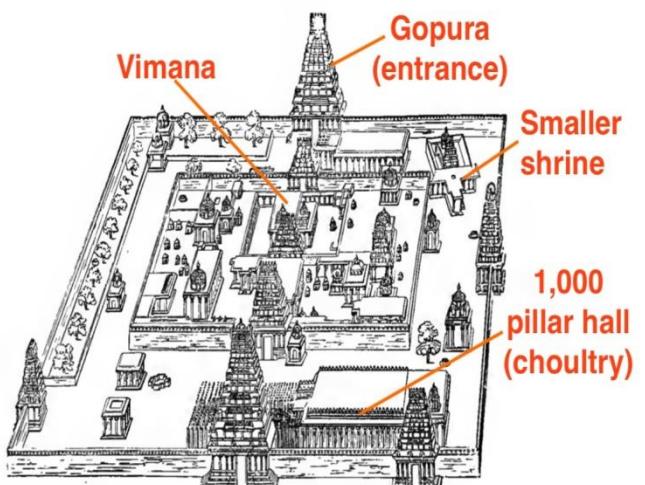
Heptahedron

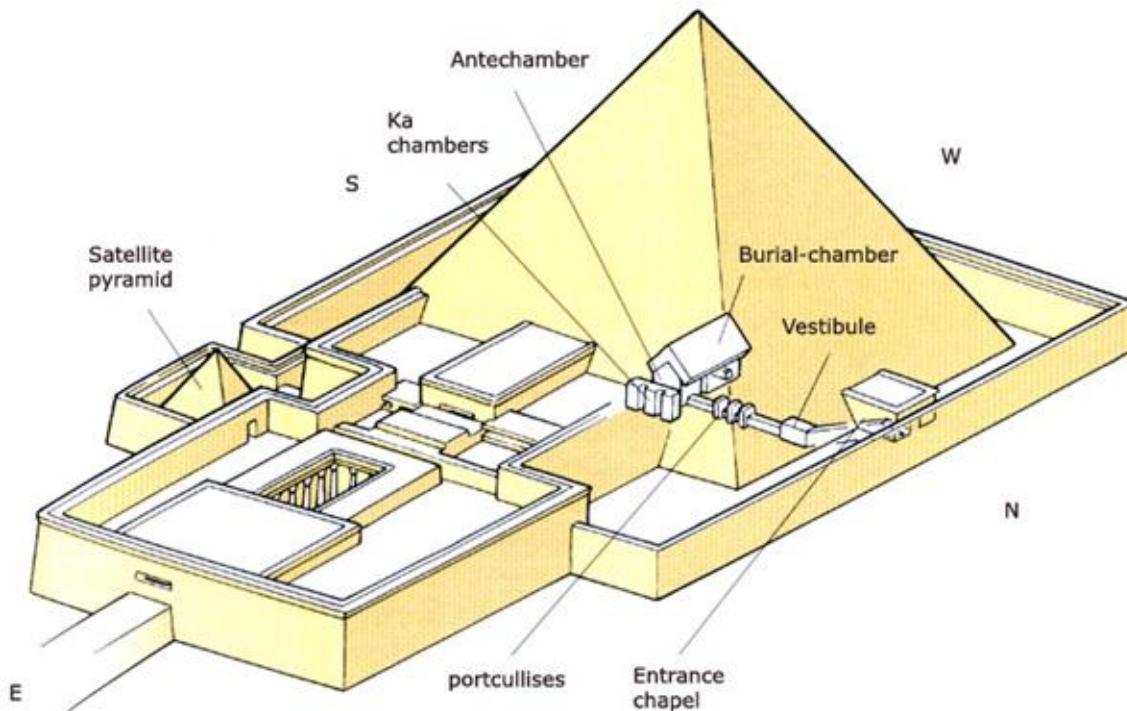
A pyramid that has a hexagonal base, that is, base with six sides and 6 triangular lateral faces, then it is a **hexagonal pyramid**. It is also called as the Heptahedron.

What is a pyramid shaped temple?

The ziggurat is a tower-like stepped pyramid-shaped temple with several floors above which the main temple was located. The construction of such monuments was common in almost all ancient cultures. As far as I know the shape of the pyramid **enhances the increase in ozone through inside the Temple**, Also there is some kind of a copper plate which is placed underneath the Idol, with which the Idol emits the positive power to the Devotes who are around. To understand the square plot plan let us study a simpler structure of the Pyramid of Egypt.

Below are examples of Square Grid structures. Hindu temples of India and Cambodia and the Egyptian Pyramid





On Pyramid Construction

The actual building of a pyramid places special emphasis on the accuracy of setting the first course of the outer facing, constructing the core and nucleus, and covering it with the outer facing and placing the pyramidion on top.

The Actual Building

We have to take into consideration: quarrying, transporting, shaping, lifting and placing each block into its final position with enough man power and enough supplies of mortar and tools etc.

All these activities were under tight supervision to preserve the correctness of shape, stability, orientation, traditional requirements, and religious demands.

THE FIRST COURSE OF THE OUTER FACING

The first course of the outer facing was very carefully monitored because it is the actual orientation of the monument. There are several examples showing how this course was considered.



At the pyramid of king

At Khufu, Unas, Pepi I and many other sites, large limestone blocks display the admirable methods of building the first course on a variety of foundations and platforms.

Djedefra, Khafra and Menkura built this course in granite (pictured right).

Khafra 'G2, at Giza the first course of the outer facing was built of polished granite which was joined by the surrounding pavement of the pyramid by an upright cut. This cut was aligned to the cardinal points for the orientation of the monument, Nabil Swelim 1990.

THE CORE AND THE NUCLEUS

Many studies and TV documentaries have proposed methods for moving big blocks of stone up ramps and by mechanical means. Some of the suggestions are remarkable. Important as these methods are, they become useless if they do not satisfy the intensity needed to complete the building within the kings' reign.

- The great pyramid of Khufu was built of 2.6 million blocks of limestone each of an average volume of One Cubic Meter, weighing 2.5 metric tons. This figure comes from the volume of the pyramid being 2,600,000 cubic meters. By the equation $(230 \times 230 \times 148/3)$ The Area Of The Base Times One Third Of The Height.

- The Turin king list tells us that Khufu reigned for 23 years.

- Assuming that the pyramid was built every day of the 23 years of his reign, and then we have 8395 days of building.

- Working hours should be 10 hours a day, and then we have 83,950 hours or 5,037,000 minutes.



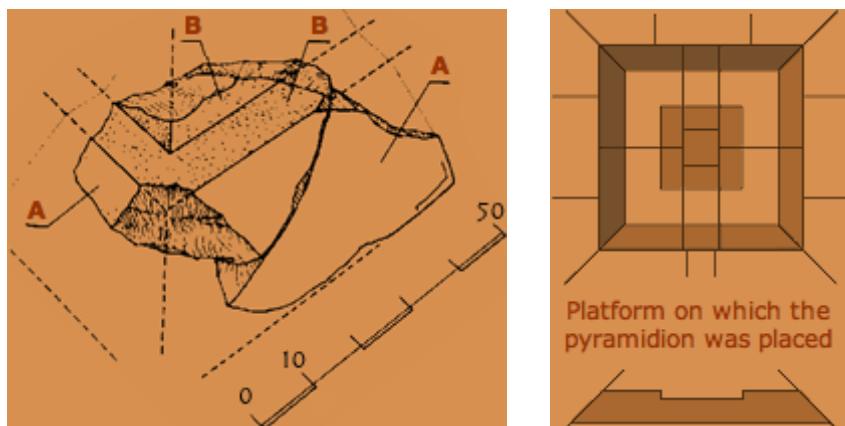
The pyramid of king Khafra 'G2, at Giza clearly showing the nucleus, the first course of the outer facing see and a large cased area towards the top where the pyramidion was once set. Tarek Swelim 1985.

- To install 2,600,000 blocks in 5,037,000 minutes at a regular rate means: that every block has to be set in less than two minutes. (1.94 min)

The building never followed that rate: it had to be much, much faster at the beginning and slower towards the end.

THE PYRAMIDION

At the very end of the building project comes the difficult task of placing the pyramidion at the apex of a pyramid. This is like putting the crown on the king's head. An amazing task, the example I present is that of the pyramid of King Khafra which I considered a few years ago. This pyramidion was prefabricated in 2 parts of diorite weighing 4 and 7.15 = total 11.15 tons. They were placed on the uppermost course of the outer facing, which created a platform. The pyramidion had to fit precisely on the platform. This is at the top of a pyramid, at a height of 144 meters, with very limited space to maneuver.



(Above left) A diorite fragment of the pyramidion of Khafra found by Selim Hassan. Drawn for Nabil Swelim by Jaroslaw Dobrowolski 1996 after Selim Hassan. (Above right) The platform on which the pyramidion was placed, slabs rearranged and drawn by Nabil Swelim 1996 after Lepsius.

When such a task was completed, taking the pyramid of Khafra as an example, we would be looking at a very beautiful monument: Well oriented, well stabilized, the first course of rose granite, a whitish gold outer facing and a dark green diorite pyramidion on top.

ARCHITECTURAL COMPOSITION OF A PYRAMID By Nabil Swelim

On Pyramid Construction

We look at the pyramids of Egypt excluding the unfinished ones and see civil engineering projects that had been successfully completed. The construction starts with preparations, namely: choosing the site, planning the project, providing for the supplies, their safe transportation and the methods of lifting the building blocks.

Preparations

THE BUILDING SITE

Constructing a pyramid is a major civil engineering project. Pyramids are built on rock formations, conglomerate, gravel, or sand surfaces which are artificially leveled or unleveled. While it will be relatively easy to level the sand surface, it would be more difficult to level gravel and very difficult to level conglomerate and rock surfaces.

The pyramid of Khufu 'G1, is built on leveled rock, while his 'queens pyramids' especially 'G1c, and the layer step pyramids at el Kula and Elephantine were built on an unleveled rock surface. The Pyramids of Khafra 'G2, and Menkura 'G3, are built on a leveled rock surface which had been extended by artificial terraces of megalithic blocks. The layer step pyramid of Snofru at Seila was built on an unleveled surface of Pliocene conglomerate. His pyramids at Dahshur are built on leveled gravel. At Meidum, the layer step pyramids of Sinki at Abydos, Nubt and El Ghanimiya, and the monuments were built on sand.

When the monument is built on a rock or conglomerate unleveled surface the pyramid shape has to consider according to a datum line. Consequently there is a construction prior to reaching the datum line.

PLANNING

Setting the orientation lines of the pyramid base or the datum level, would be by setting right angles to true directions. The north south direction is by observing the North Star and or by observing the rising and setting of a certain star on an artificial horizon. The east-west direction was by observing the equinox and/or by shadows of the sun light.

At Giza with Khufu and Khafra we have marks of a series of approximations leading to the perfect orientation of the pyramid base. At the layer step pyramid of Sinki planning was by means of brick markers discovered. They were placed to serve as reference points to orientation, alignments, inclination, and other building features. Brick alignment markers are also noted on the east side of the Layer pyramid at Zawyet El Aryan.

SUPPLIES

The building material is usually brought from sources close to the site. All pyramids are built of stone from the nearest quarries, thus: granite at layer step pyramid of Elephantine, sand stone at layer step pyramid of El Ghenimiya and limestone for all the other pyramids. When fine stone is needed: for the lowest course of the outer facing, the outer facing itself and the pyramidion in the superstructure and for the sarcophagus, portcullis and some inner chambers in the substructure. Their quarries and sources are deep in the desert or far upstream. In all cases transportation is needed. Preparing pyramidions and sarcophagi required higher skills.

TRANSPORTATION

Quarrying is a skill which has existed during all phases of human civilizations. In Egypt the quarries are numerous and their output had to be transported - we are talking about solid blocks weighing from less than one ton to hundreds of tons. In Ancient Egypt the preferred quarries of limestone were in Middle Egypt, sand stone in Upper Egypt and granite from Aswan. Most preferable were those closest to the banks of the river. As for diorite, quartzite, shiest, breccia and rare stones, they were quarried from far locations. These also had to be brought to the river for transportation. Mining copper and other metals for tools came from remote locations in Sinai.

The quarried blocks and mined metal had to be brought to the river, loaded on barges which sailed downstream. On arrival to the river banks closest to the destination, unloading takes place.

SAFETY

The safety of the Nile cruise varied during the 3 seasons; in the flood season there was the danger of drifting and in the harvesting season there was the danger of grounding. Yet there was a sudden danger of flash floods rushing down from the eastern desert.

We have observed that for the safety of sailing and unloading the stone supplies at Dahshur and Giza, the Ancient Egyptians of the 4th dynasty, built a great dam across Wadi Garawi (pictured below), in the east desert to ensure the safety of the transported loads from the flash flood.

The unloading takes place on the flood plain level and the building site could be close or far (may be a few kilometers). The chosen site of the pyramid project is usually on the desert plateau which was 30 to 60 meters higher than the flood plain.

These are important problems that have to be solved before the first block is set in the project.



Remains of the Dam at Wadi Garawi south of Helwan; it dates to the 4th dynasty 2600 BC. Nabil Swelim 1990.

LIFTING

Once the blocks are at the building site, they are built in their final position in the edifice. As the pyramid grows the blocks are lifted higher and higher.

We have remains of a ramp discovered south of the queens of Khufu at Giza (pictured right). Four ramps at the small unfinished layer step pyramid Sinki at Abydos. Herodotus reports mechanical lifting by short blocks of wood.

Every now and then a new idea turns up, unfortunately hitherto nothing is conclusive.

All these activities were achieved with the intensity required to complete the project during the lifetime of the king.

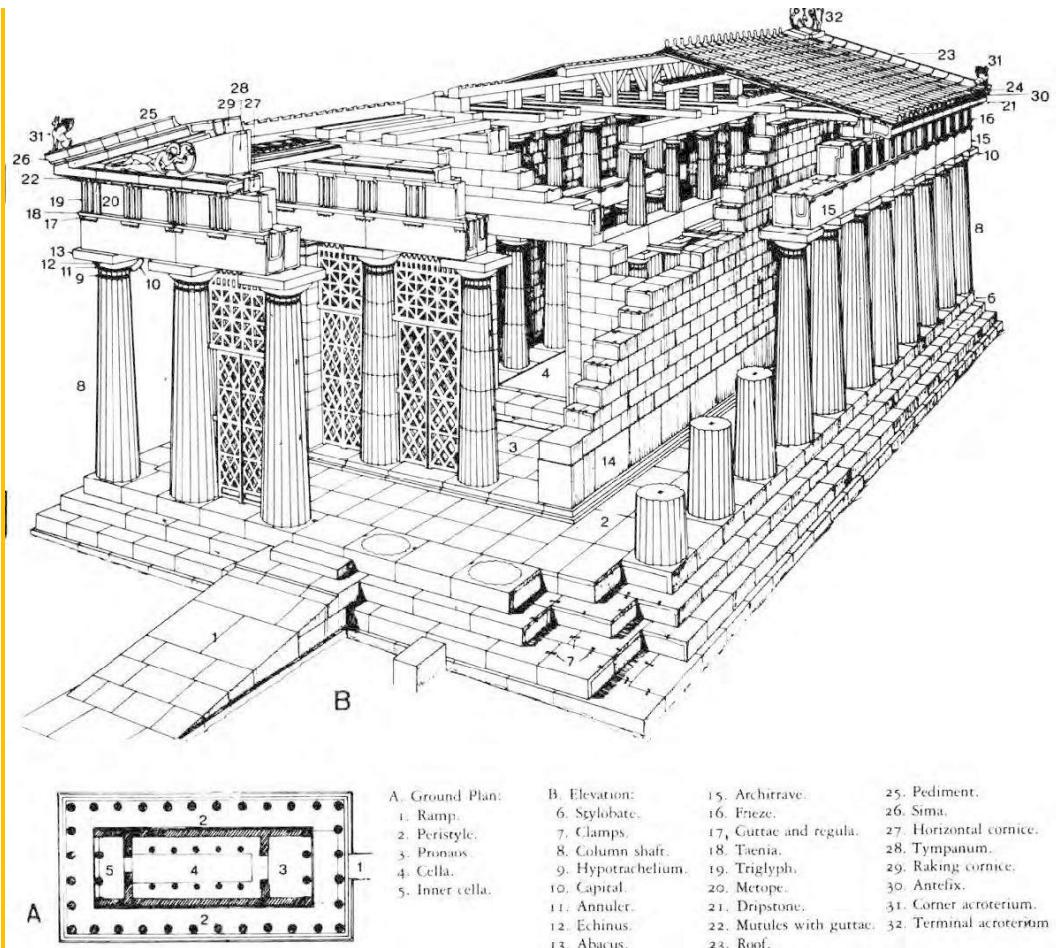


Retaining walls of a ramp at the pyramids of the queens of Khufu near the Sphinx. This ramp was cleared of the filling between the walls. The ramp was probably constructed for building a small pyramid (G1X) 50 m away to the north. The pyramid was discontinued at a very early stage. It is close to the shaft of Queen Hetepheres, the mother of King Khufu. Tarek Swelim 1991.

An aerial view of layer step pyramid Sinki at Abydos shows the construction ramps on the 4 sides of the unfinished monument. They were starting from the desert surface over the foundation of the outer facing (layer 3) and leaning on the nucleus (layers 2, 1, and the core). Redrawn by Nabil Swelim 1990.

https://www.bradshawfoundation.com/pyramids_of_egypt/construction.php

Ancient Greek Temple ruins show common use of 4 sides or Square





The design principle of Hindu temples

The design principle of Hindu temples extensively uses circles and squares - both in their horizontal layout and vertical spire design. A Hindu temple is a symmetry-driven structure, with many variations, on a square grid of padas, depicting perfect geometric shapes such as circles and squares. A Hindu temple is a symmetry-driven structure, with many variations, on a square grid of padas, depicting perfect geometric shapes such as circles and squares. Susan Lewandowski states that the underlying principle in a Hindu temple is built around the belief that all things are one, everything is connected. The 3 basic components of the Hindu architecture are Mandapa or the portico which leads to the garbhagriha, where the worshipers assemble. Shikhara that is the spire above the sanctum. Vaahan which is the mount or vehicle of the main deity of the temple.

A shikhara over the garbhagriha chamber where the presiding deity is enshrined is the most prominent and visible part of a Hindu temple of North India.

The land should always be square or rectangular for the construction of the temple. Also, the four directions of the land should be parallel. It is very auspicious to have a road around the temple. Similarly, it is very auspicious to have a slope in the north-east and north-east of the temple.

What are the four main components of a Hindu temple?

In general, a Hindu temple like Kailasanatha has four main parts: **gopura (gateway)**, **mandapa (porch or hallway for worshippers to gather)**, **garbha griha (the inner shrine)**, and the **shikhara (the exterior tower)**.

The basic form of a Hindu structural temple consists of the following.

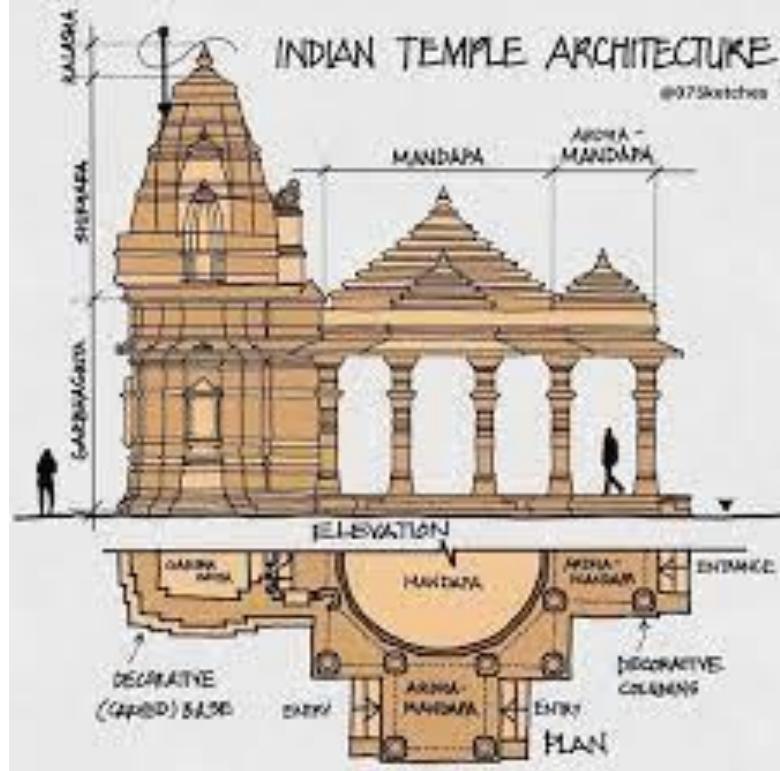
- Garbhagriha: It literally means 'womb-house' and is a cave like a sanctum. ...
- Mandapa: It is the entrance to the temple. ...

- Shikhara or Vimana: ...
- Amalaka: ...
- Kalasha: ...
- Antarala (vestibule): ...
- Jagati: ...
- Vahana:

This proves the involvement of **circle** with **square**, with respect to the **temple** concept and philosophy. The most impressive aspect of the **temple** ...

Role of Fractal Geometry in Indian Hindu Temple Architecture

The geometry of a plan starts with a line, forming an angle, evolving a triangle, then a **square** and distinctly a **circle** and so on, ultimately deriving complex. It may be a portico or colonnaded (**series** of columns placed at regular intervals) hall that incorporates space for a large number of worshippers. From the **square** all requisite forms can be derived: the triangle, hexagon, octagon, **circle** etc. The **architect** calls this **square** the vastu-purusha-mandala-vastu, Ancient architectural tradition, Hindu temples are symbols of the model of the cosmos and their ... to **square** and **square** to **circle** is not one which can be. The presence of a **Square-Circle-Sequence (SCS)** in the **temple** is a governing device...



In their paper, Role of Fractal Geometry in Indian Hindu Temple Architecture, Dhrubajyoti Sardar, Architecture & Planning Department, IIT Roorkee Roorkee, Uttarakhand, India have the following to say about the Temple arrangements:

1. VASTUPURUSHAMANDALA

The *Vastupurusha* (*figure 01*) is a key concept in Hindu temple architecture. The plan of the Hindu temple strictly follows the principles described in Puranas related to the *Vastupurushamandala*. It follows three basic sets of iteration and further sub-categories. Limited technical expertise exists about all the mandalas and their formulation through alteration and repetition of fractals.

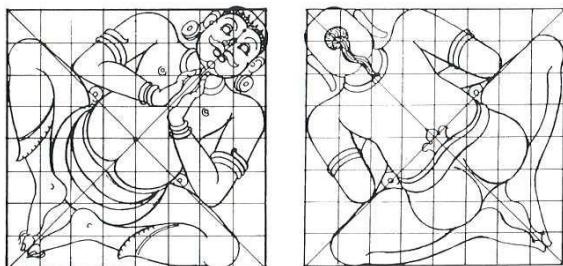


Figure 01: The image of Vastupurushamandala with 64 blocks for different deities

Source: http://hindutemplearchitectureandsculpture-filialt.wikispaces.com/file/view/Vastu_Canon.png/182843879/800x380/Vastu_Canon.png

The above figure shows the traditional *Vastupurushamandala*. There are mainly two types of mandalas, one is with sixty-four squares and another with eighty-one squares where each square is dedicated to a deity. (*see figure 02 below*)

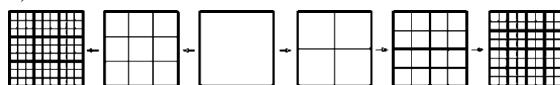


Figure 02: Fractal characteristics of different mandalas and their iterations from the sakala mandala

From left: Paramasaayika, Pitah, Sakala, Pechaka, Mahapitah, MandukaChandita mandala

Source: I. Md Rian et al. / Building and Environment 42 (2007) 4093–4107

2. VINYASASUTRA [LAYOUT & ORIENTATION]

Figure 04: Plan of Brihadeshwara Temple, Thanjavur, showing the Vinyasasutra

Source: http://1.bp.blogspot.com/-dnl34cWSH3k/UZXC_pg5RSI/AAAAAAAAGs/qcED3dcnpT4/s1600/temple+archit.png

In Sanskrit '*Vinyaasa*' means orientation and '*sutra*' means thread, line or axis. It is related with the lay out and orientation of temple plans. *Vastupurushamandala* is the base of evolution of a temple plan. *Vinyasasutra* comes into play after the initial evolution of the temple plan. During the determination of the axis and orientation of the temple and its surroundings, ancient architects used to follow the process described in Hindu scripts like *Vastushashtra*, *Manasara* etc. However, all the plans followed geometries with fractal character. It is postulated that, some of them were made consciously and some unconsciously. (*See figure 04*).

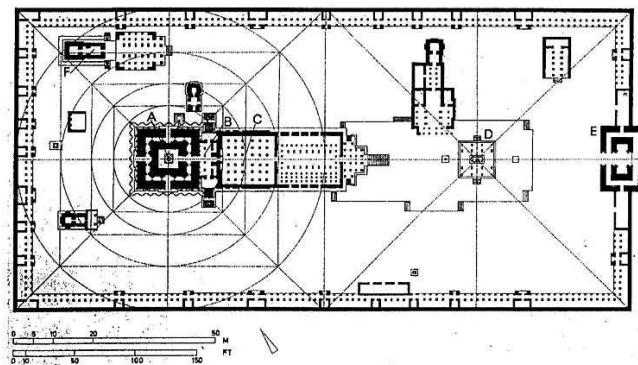


Fig 1 Plan of The Brihadishwara Temple, Tanjore.
A Volkhausen, Living Architecture, p.87

3. REASON BEHIND THE U

4. SE OF FRACTAL GEOMETRY IN HINDU TEMPLE ARCHITECTURE

The following are some probable reasons behind the use of Fractal Geometry in Hindu temple architecture.

- a) It can be argued that, practicing fractals is none other than the implication of the sense of completeness since the concept of fractals is that of the part to whole and whole to part.
- b) The fractal theory fully supports the Hindu philosophicalconcept of „one among all, all is one“. It brings the feeling of oneness (the concept of Atman).
- c) It can bring a sense of strength, both structurally as well as visually.
- d) Self-similar elements in the design, seek the attention of the visitors and pilgrims repeatedly and gradually entice them to think about it and create a clear state of mind with a holistic perception.
- e) Self-similar repetition in structure generates an identity of elements as well as form.
- f) Experimentation can also be a reason behind theevolution and realisation of fractal theory in Hindu temple architecture through the ages.
- g) The term, „Self-similar“ brings a sense of modularity. Therefore, it generates the same style of work using the same modules, which saves resources. Local materials, workmanship and time offer ease of execution across huge structures, such as temples within the same region.
- h) Making of similar kind of elements repeatedly generates a habit and practice and practice perfects the execution.
- i) From an aesthetical viewpoint, a fractal geometry brings about „order in chaos“ and thereby „a beauty incomplexity“.

They conclude that relationship between fractal theory and Hindu cosmology, role of fractal geometry in Hindu temple architecture, behavioural attributes of action of fractals and possible reason behind them all add to complete the Temple. It endeavours to prove the essential role of fractals in Hindu temple architecture.

Chapter 1

4

TEMPLE LAYOUT ISSUES of HINDU TEMPLES

Vastu. The Sanskrit word *vāstu* means a dwelling or house with a corresponding plot of land. The *vrddhi*, *vāstu*, takes the meaning of "the site or foundation of a house, site, ground, building or dwelling-place, habitation, homestead, house". The underlying root is *vas* "to dwell, live, stay, reside". The term *shastra* may loosely be translated as "doctrine, teaching". *Vāstu-Śastras* (literally, science of dwelling) are ancient Sanskrit manuals of architecture. These contain *Vastu-Vidya* (literally, knowledge of dwelling).

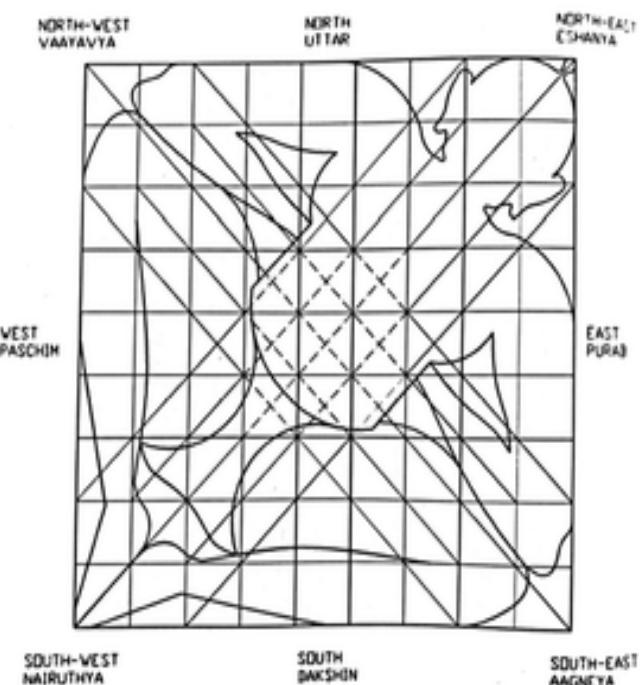
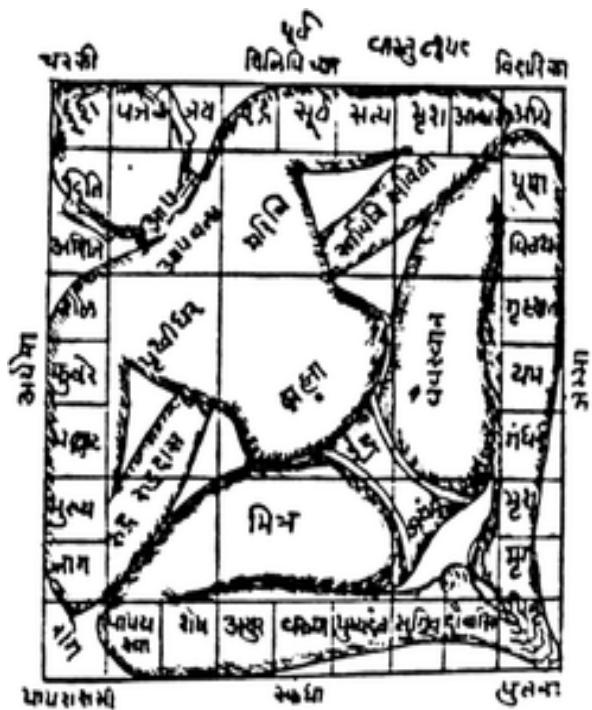
Ancient India produced many Sanskrit manuals of architecture, called Vastu Sastra. Many of these are about Hindu temple layout (above), design and construction, along with chapters on design principles for houses, villages, towns. The architect and artists (Silpins) were given wide latitude to experiment and express their creativity. There exist many *Vāstu-Śastras* on the art of building houses, temples, towns and cities. One such *Vāstu Śastra* is by Thakkura Pheru, describing where and how temples should be built. By 6th century AD, Sanskrit manuals for constructing palatial temples were in circulation in India. *Vāstu-Śastra* manuals included chapters on home construction, town planning, and how efficient villages, towns and kingdoms integrated temples, water bodies and gardens within them to achieve harmony with nature. While it is unclear, states Barnett, as to whether these temple and town planning texts were theoretical studies and if or when they were properly implemented in practice, the manuals suggest that town planning and Hindu temples were conceived as ideals of art and integral part of Hindu social and spiritual life.

The Silpa Prakasa of Odisha, authored by Ramachandra Bhattaraka Kaulachara sometime in ninth or tenth century CE, is another *Vāstu Śastra*. *Silpa Prakasa* describes the geometric principles in every aspect of the temple and symbolism such as 16 emotions of human beings carved as 16 types of female figures. These styles were perfected in Hindu temples prevalent in eastern states of India. Other ancient texts found expand these architectural principles, suggesting that different parts of India developed, invented and added their own interpretations. For example, in Saurastra tradition of temple building found in western states of India, the feminine form, expressions and emotions are depicted in 32 types of *Nataka-stri* compared to 16 types described in *Silpa Prakasa*. *Silpa Prakasa* provides brief introduction to 12 types of Hindu temples. Other texts, such as *Pancaratra Prasada Prasadhana* compiled by Daniel Smith and *Silpa Ratnakara* compiled by Narmada Sankara provide a more extensive list of Hindu temple types.

| Roga | Ahi | Mukhya | Bhallata | Soma | Bhujaga | Aditi | Diti | Agni |
|----------------|-------|-----------------------|---------------------|------|--------------|---------------------------------|---------|-----------------|
| Papa-Yaksh-man | Rudra | | | | | | Apa | Par-janya |
| Shosha | | Raja Yaksh-man | PRTHIVIDHARA | | | Apa Vatsa | | Jaya- yanta |
| Asura | | M I T R A | BRAHMA | | | A R Y A M A N | | Indra |
| Varuna | | | | | | | | Surya |
| Kusuma-Danta | | | | | | | | Satya |
| Sugriva | | Indra | VIVASVAN | | | Savitr | | Bhrsha |
| Dau-varika | Jaya | | | | | | Savitra | Antar- Iksha |
| Pitarah | Mrga | Bhrng-Raja | Gan-dharva | Yama | Brhat-Kshata | Vitatha | Pushan | Anila |

Ancient Sanskrit manuals for temple construction discovered in Rajasthan, in northwestern region of India, include Sutradhara Mandana's Prasadamandana (manual for planning and building a temple) with chapters on town building. Manasara shilpa and Mayamata, texts of South Indian origin, estimated to be in circulation by 5th to 7th century AD, is a guidebook on South Indian Vastu design and construction. Isanasivagurudeva paddhati is another Sanskrit text from the 9th century describing the art of building in India in south and central India. In north India, Brihatsamhita by Varāhamihira is the widely cited ancient Sanskrit manual from 6th century describing the design and construction of Nagara style of Hindu temples.

These ancient Vāstu Śastras, often discuss and describe the principles of Hindu temple design, but do not limit themselves to the design of a Hindu temple. They describe the temple as a holistic part of its community, and lay out various principles and a diversity of alternate designs for home, village and city layout along with the temple, gardens, water bodies and nature. The 8x8 (64) grid Manduka Vastu Purusha Mandala layout for Hindu Temples. It is one of 32 Vastu Purusha Mandala grid patterns described in Vastu sastras. In this grid structure of symmetry, each concentric layer has significance.



The central area in all mandala is the Brahmasthana. Mandala "circle-circumference" or "completion", is a concentric diagram having spiritual and ritual significance in both Hinduism and Buddhism. The space occupied by it varies in different mandala – in Pitha (9) and Upapitha (25) it occupies one square module, in Mahaapitha (16), Ugrapitha (36) and Manduka (64), four square modules and in Sthandila (49) and Paramasaayika (81), nine square modules. The Pitha is an amplified Prithvimandala in which, according to some texts, the central space is occupied by earth. The Sthandila mandala is used in a concentric manner. The most important mandala is the Manduka/Chandita Mandala of 64 squares and the Paramasaayika Mandala of 81 squares. The normal position of the Vastu Purusha (head in the northeast, legs in the southwest) is as depicted in the Paramasaayika Mandala. However, in the Manduka Mandala the Vastu Purusha is depicted with the head facing east and the feet facing west. As is believed that every piece of a land or a building has a soul of its own and that soul is known as Vastu Purusha a site of any shape can be divided using the Pada Vinyasa. Sites are known by the number of squares. They range from 1x1 to 32x32 (1024) square sites. Aspects in Temple Construction

1. There are many aspects involved in constructing a temple. Acarya, director for the temple construction and shilpi (sculptor) play major role in the construction of a temple. The temple's acarya is expected to know silpa sastra although not in as much detail as a shilpi. Temple construction begins with search of a proper site. Soil and location are examined by acarya and shilpi. This is called Bhupariksha.
2. This is followed by nagara/grama nirmana. Here, the layout of town, its size, breadth of different levels of streets, locations and sizes of facilities like water tanks are determined based on the size of town. There are different names for different sizes of towns, like grama, kheta, kharvata, durga, nagara. Then the location of temple (brahma sthana) in the town is decided.

Temple is usually in the center of village so that every villager has access to it. The entire arrangement is called *grama vinyasa*.

3. Then the size of temple is determined. For this, size of the image of main deity is to be known, since the size of a temple is always a fixed multiple of the size of image of main deity. Then wood/metal/stone is selected for the image. The icon has three parts, main icon (*vigraha*), pedestal (*peetha*) and platform (*adhisthana* or *upa peetha*).

4. Then tests to determine quality of stone are prescribed by the Agamas. There are three kinds of stone, male female and neuter. When hit with an iron rod if the stone produces good sound and spark, it is male and should be used for the main icon. If it produces sound but not spark it is female and should be used for pedestal. If it produces neither, it is neuter and should be used for platform. There are various standards for the relative proportions of image, gopura, prakara etc. and also the relative proportions of various parts of the *vigraha*. The units for measuring *vigraha* are tala, angula and yava. Tala is a multiple of angula and angula is a multiple of yava. More than the specific size of each unit, the multiplicity and relative sizes are important. The proportions of Head-Trunk-Arms-Legs of images are specified. The finer specifications like nose, nail, ears and their shapes are also mentioned. Generally the standard is to use dasatala (ten talas) for the height of image of male deity, navatala (nine talas) for His consort and astatala (eight talas) for bhakta.

5. The teams that built Hindu temples The 6th-century *Brihat samhita* is a Sanskrit encyclopedia. Its chapters 57-60 discuss different styles and design of Hindu temples. Above: the text and commentary in Nepalaksara, Devanagari and Tamil Grantha scripts. Indian texts call the craftsmen and builders of temples as “*Silpin*”, derived from “*Silpa*”. One of earliest mentions of Sanskrit word *Silpa* is in Atharvaveda, from about 1000 BC, which scholars have translated as any work of art. Other scholars suggest that the word *Silpa* has no direct one word translation in English, nor does the word “*Silpin*”. *Silpa*, explains Stella Kramrisch, is a multicolored word and incorporates art, skill, craft, ingenuity, imagination, form, expression and inventiveness of any art or craft. Similarly a *Shilpin*, notes Kramrisch, is a complex Sanskrit word, describing any person who embodies art, science, culture, skill, rhythm and employs creative principles to produce any divine form of expression. *Silpins* who built Hindu temples, as well as the art works and sculpture within them, were considered by the ancient Sanskrit texts to deploy arts whose number are unlimited, *Kala* (techniques) that were 64 in number, and *Vidya* (science) that were of 32 types. The Hindu manuals of temple construction describe the education, characteristics of good artists and architects. The general education of a Hindu *Shilpin* in ancient India included

Lekha or Lipi (alphabet, reading and writing), Rupa (drawing and geometry), Ganana (arithmetic). These were imparted from age 5 to 12. The advanced students would continue in higher stages of *Shilpa Sastra* studies till the age of 25. Apart from specialist technical competence, the manuals suggest that best *Silpins* for building a Hindu temple are those who know the essence of *Vedas* and *Agamas*, consider themselves as students, keep well verse with principles of traditional sciences and mathematics, painting and geography. Further they are kind, free from jealousy, righteous, have their sense under control, of happy disposition, and ardent in everything they do.

According to **Silparatna**, a Hindu temple project would start with a Yajamana (patron), and include a Sthapaka (guru, spiritual guide and architect-priest), a Sthapati (architect) who would design the building, a Sutragrahan (surveyor), and many Vardhakins (workers, masons, painters, plasterers, overseers) and Taksakas (sculptors). While the temple is under construction, all those working on the temple were revered and considered sacerdotal by the patron as well as others witnessing the construction. Further, it was a tradition that all tools and materials used in temple building and all creative work had the sanction of a sacrament. For example, if a carpenter or sculptor needed to fell a tree or cut a rock from a hill, he would propitiate the tree or rock with prayers, seeking forgiveness for cutting it from its surroundings, and explaining his intent and purpose. The axe used to cut the tree would be anointed with butter to minimize the hurt to the tree. Even in modern times, in some parts of India such as Odisha, Visvakarma Puja is a ritual festival every year where the craftsmen and artists worship their arts, tools and materials.

Duties of temple administration are also specified in the Agamas - organizing festivals, encourage art forms and conduct shows to encourage artists, create accommodation for pilgrims from other towns, run hospitals, regularly conducting religious discourses etc. Town planning, engineering, architecture, fine arts, civics, and many other subjects are dealt in the agamas, which relate to the various interests of people and involve them at different capacities and also direct their work towards a higher goal.

Steps in Temple Construction

Steps in Temple Construction: The procedure for building a temple is extensively discussed, and it could be expressed in short as "Karshanadi Pratisthantam", meaning beginning with "Karshana" and ending with "Pratistha". The details of steps involved vary from one Agama to another, but broadly these are the steps in temple construction:

1. Bhu pariksha: Examining and choosing location and soil for temple and town. The land should be fertile and soil suitable.
2. Sila pariksha: Examining and choosing material for image
3. Karshana: Corn or some other crop is grown in the place first and is fed to cows. Then the location is fit for town/temple construction.
4. Vastu puja: Ritual to propitiate vastu devata.
5. Salyodhara: Undesired things like bones are dug out.
6. Adyestaka: Laying down the first stone
7. Nirmana: Then foundation is laid and land is purified by sprinkling water. A pit is dug, water mixed with navaratnas, navadhanyas, navakhaniyas is then put in and pit is filled. Then the temple is constructed.
8. Murdhestaka sthapana: Placing the top stone over the prakara, gopura etc. This again involves creating cavities filled with gems minerals seeds etc. and then the pinnacles are placed.
9. Garbhanyasa: A pot made of five metals (pancaloha kalasa sthapana) is installed at the place of main deity.
10. Sthapana: Then the main deity is installed.
11. Pratistha: The main deity is then charged with life/god-ness.

Before the temple is opened for daily worship, there are some preparatory rituals to be done, like: Anujna: the priest takes permission from devotees and lord Ganesha to begin rituals Mrit samgrahana: Collecting mud Ankurarpana: Sowing seeds in pots of mud collected and waiting till they germinate Rakshabandhana: The priest binds a holy thread on his hand to take up the assignment. Punyahavacana: Purifying ritual for the place and invoking good omens Grama santi: Worship for the good of village and to remove subtle undesired elements Pravesa bali: Propitiation of various gods at different places in the temple, rakshoghna puja (to destroy asuric elements) and of specific gods like Kshetra palaka (devata ruling the town) Vastu Santi: Pacifying puja for vastu (this happens twice and this is the second time)

Yagasala: Building the stage for homas, along with vedika. Kalasasthapana: Installing kalasam Samskara: Purifying the yaga sala Kalasa puja, yagarambha: Worshipping the kalasa as god and propitiating deities through fire Nayanonmeelana, Pratimadhviva: Opening eyes of the god-image, installing it and giving it life. Then specific worship is done to deity, as prescribed. For instance in the case of Siva, this is followed by astabandhana and kumbhabhisheka. Temple Design From the proportions of the inner sanctum to the motifs carved into the pillars, the traditional temple takes its first form on the master sthapati's drawing board. The architect initially determines the fundamental unit of measurement using a formula called ayadhi. This formula, which comes from Jyotisha, or Vedic astrology, uses the nakshatra (birth star) of the founder, the nakshatra of the village in which the temple is being erected matching the first syllable of the name of the village with the seed sounds mystically associated with each nakshatra and the nakshatra of the main Deity of the temple. This measurement, called danda, is the dimension of the inside of the sanctum and the distance between the pillars. The whole space of the temple is defined in multiples and fractions of this basic unit. The Shastras are strict about the use of metals, such as iron in the temple structure because iron is mystically the crudest, most impure of metals. The presence of iron, sthapatis explain, could attract lower, impure forces. Only gold, silver, and copper are used in the structure, so that only the most sublime forces are invoked during the pujas. At especially significant stages in the temple construction (such as ground-breaking and placement of the sanctum door frame), pieces of gold, silver and copper, as well as precious gems, are ceremoniously embedded in small interstices between the stones, adding to the temple's inner-world magnetism. These elements are said to glow in the inner worlds and, like holy ash, are prominently visible to the Gods and Devas. The ground plan is described as a symbolic, miniature representation of the cosmos. It is based on a strict grid made up of squares and equilateral triangles which are imbued with deep religious significance. To the priest-architect the square was an absolute and mystical form. The grid, usually of 64 or 81 squares, is in fact a mandala, a model of the cosmos, with each square belonging to a deity. The position of the squares is in accordance with the importance attached to each of the deities, with the square in the center representing the temple deity; the outer squares cover the gods of lower rank.

Agamas say that the temple architecture is similar to a man sitting - and the idol in garbagriha is exactly the heart-plexus, gopuram as the crown etc. The construction of the temple follows in three dimensional form exactly the pattern laid out by the mandala. The relationship between the underlying symbolic order and the actual physical appearance of the temple can best be understood by seeing it from above which was of course impossible for humans until quite recently. Another important aspect of the design of the ground plan is that it is intended to lead from the temporal world to the eternal. The principal shrine should face the rising sun and so

should have its entrance to the east. Movement towards the sanctuary, along the east-west axis and through a series of increasingly sacred spaces is of great importance and is reflected in the architecture. A typical temple consists of the following major elements 1. an entrance, often with a porch 2. one or more attached or detached mandapas or halls 3. the inner sanctum called the garbagriha, literally 'womb chamber' 4. the tower build directly above the garbagriha. Significance of the number eight in temple design Vastu Shastra describes the inner sanctum and main tower as a human form, structurally conceived in human proportions based on the mystical number eight. According to Dr. V. Ganapati Sthapati, Senior Architect at the Vastu Government College of Architecture, the vibration of the spaceconsciousness, which is called time, is the creative element, since it is this vibratory force that causes the energetic space to turn into spatial forms. Therefore, time is said to be the primordial element for the creation of the entire universe and all its material forms. When these vibrations occur rhythmically, the resultant product will be an orderly spatial form. This rhythm of the time unit is traditionally called talam or layam. Since every unit of time vibration produces a corresponding unit of space measure, vastu science derives that time is equal to space. This rhythm of time and space vibrations is quantified as eight and multiples of eight, the fundamental and universal unit of measure in the vastu silpa tradition. This theory carries over to the fundamental adi talam (eight beats) of classical Indian music and dance. Applying this in the creation of a human form, it is found that a human form is also composed of rhythmic spatial units.

According to the Vastu Shastras, at the subtle level the human form is a structure of eight spatial units devoid of the minor parts like the hair, neck, kneecap and feet, each of which measures one-quarter of the basic measure of the body and, when added on to the body's eight units, increases the height of the total form to nine units. Traditionally these nine units are applied in making sculptures of Gods. Since the subtle space within our body is part of universal space, it is logical to say that the talam of our inner space should be the same as that of the universe. But in reality, it is very rare to find this consonance between an individual's and the universal rhythm. When this consonance occurs, the person is in harmony with the Universal Being and enjoys spiritual strength, peace and bliss. Therefore, when designing a building according to vastu, the architect aims at creating a space that will elevate the vibration of the individual to resonate with the vibration of the built space, which in turn is in tune with universal space. Vastu architecture transmutes the individual rhythm of the indweller to the rhythm of the Universal Being.

The **Agamas** are a collection of several Tantric literature and scriptures of Hindu schools. The term literally means tradition or "that which has come down", and the Agama texts describe cosmology, epistemology, philosophical doctrines, precepts on meditation and practices, four kinds of yoga, mantras, temple construction, deity worship and ways to attain sixfold desires. These canonical texts are in Tamil and Sanskrit. Agamas were predominant in South India but Sanskritized later.



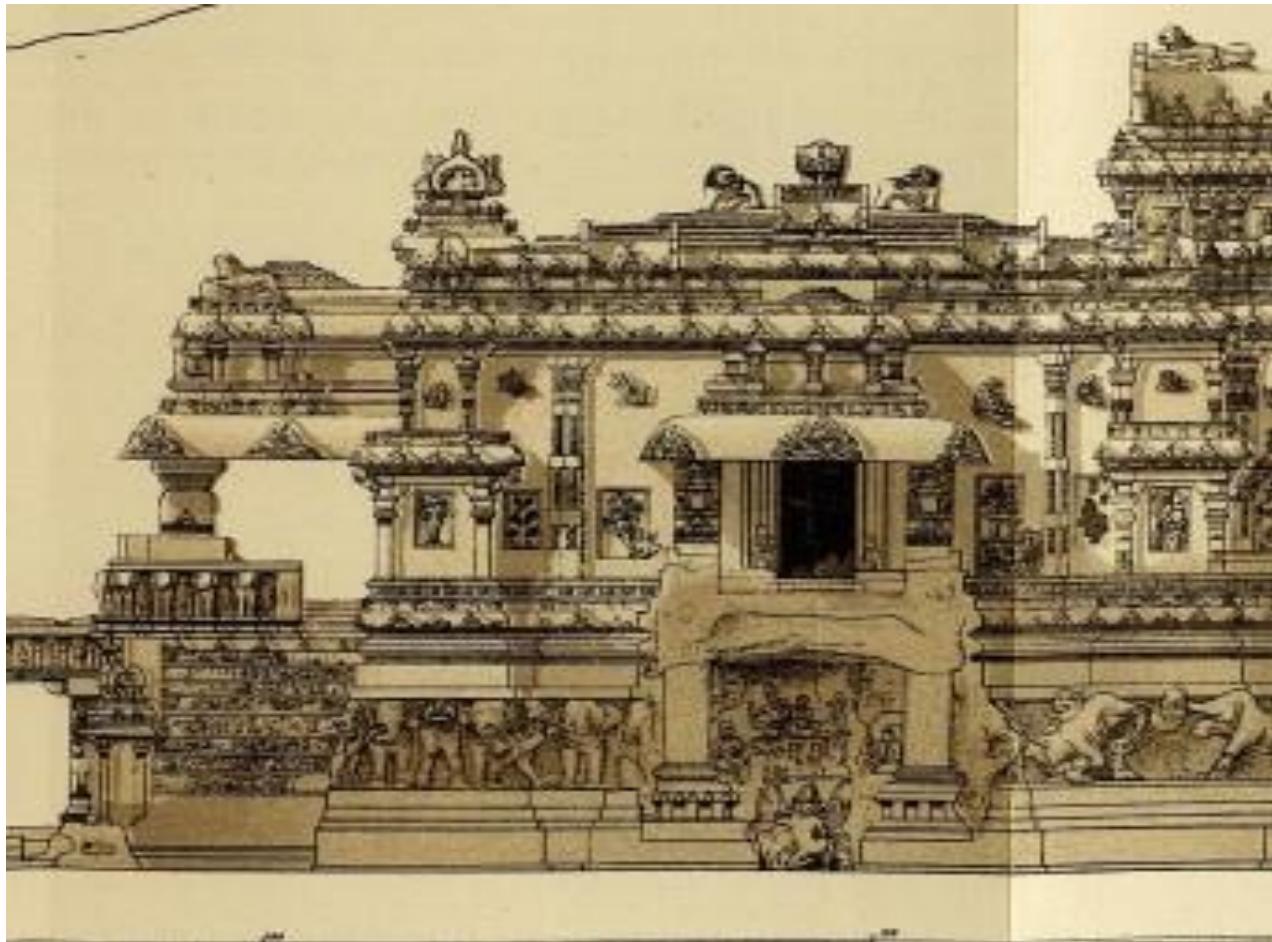
Small Hindu Temple of Kidel, Java- Marianne North

The Vastu-Purusha-Mandala- The goal of a temple's design is to bring about the descent or manifestation of the unmanifest and unseen. The architect or sthapati begins by drafting a square. The square is considered to be a fundamental form. It presupposes the circle and results from it. Expanding energy shapes the circle from the center; it is established in the shape of the square. The circle and curve belong to life in its growth and movement. The square is the mark of order, the finality to the expanding life, life's form and the perfection beyond life and death. From the square all requisite forms can be derived: the triangle, hexagon, octagon, circle etc. The architect calls this square the vastu-purusha-mandalavastu, the manifest, purusha, the Cosmic Being, and mandala. The vastu-purusha-mandala represents the manifest form of the Cosmic Being; upon which the temple is built and in whom the temple rests. The temple is situated in Him, comes from Him, and is a manifestation of Him. The vastu-purusha-mandala is both the body of the Cosmic Being and a bodily device by which those who have the requisite knowledge attain the best results in temple building. In order to establish the vastu-purusha-mandala on a construction site, it is first drafted on planning sheets and later drawn upon the earth at the actual building site. The drawing of the mandala upon the earth at the commencement of construction is a sacred rite. The rites and execution of the vastupurusha-mandala sustain the temple in a manner similar to how the physical foundation supports the weight of the building. Based on astrological calculations the border of the vastu-purusha-mandala is subdivided into thirtytwo smaller squares called nakshatras. The number thirty-two geometrically results from a repeated division of the border of the single square. It denotes four times the eight positions in space: north, east, south, west, and their intermediate points. The closed polygon of thirty-two squares symbolizes the recurrent cycles of time as calculated by the movements of the moon. Each of the nakshatras is ruled over by a Deva, which extends its influence to the mandala. Outside the mandala lie the

four directions, symbolic of the meeting of heaven and earth and also represent the ecliptic of the sun-east to west and its rotation to the northern and southern hemispheres.

The center of the mandala is called the station of Brahma, the creator of the universe. Surrounding Brahma are the places of twelve other entities known as the sons of Aditi, who assist in the affairs of universal management. The remaining empty squares represent akasha or pure space. The vastupurusha-mandala forms a diagram of astrological influences that constitute the order of the universe and the destinies of human lives. When placed on the building site, along with astrological calculations, can the auspicious time to begin temple construction be determined. The ground breaking ceremony From the diagram of the vastu-purusha-mandala the architect proceeds to develop the vertical and horizontal dimensions of the temple. The plotting graphs of the temple are divided into two main sections-the ground plan and the vertical alignment. The square, the rectangle, the octagon and the pentagon are fundamental patterns in the horizontal or ground plan. In the vertical alignment the pyramid, the circle and the curve are most prominent. The subdivisions of the ground plan include the brahmasthana (the main shrine and smaller chapels) and the mandapam (balconies, assembly halls and auditoriums). The vertical plan consists of drawings for the gopuram, entrance ways, the vimana, the structure above the main shrine, and the prakara, walls. The brahmasthana is the principal location in a temple and is where the seat of the presiding Diety will be placed. At the base of the foundation of the brahmasthana, located at the station of Brahma on the vastu-purusha-mandala, a ritual called the garbhadhana is performed called. The ritual invites the soul of the temple to enter within the buildings confines. During this ritual, a golden box is placed in the earth as part of the ground-breaking ceremony. The interior of the box is divided into smaller units exactly resembling the vastu-purusha-mandala. All the units of the gold box are first partially filled with dirt. In the thirty-two units representing the nakshatras, the units of Brahma, and the twelve sons of Aditi, the priest places an appropriate mantra in written form to invoke the presence of the corresponding Devata.

The sanskrit mantras chanted by the priest are as important as the actual mandala. The mantra infuses the mandala with spiritual powers. The mantras are the subtle form of the mandala and therefore the two are inseparable. In the unit of Brahma, Ananta, a golden serpent with many raised hoods is placed. It is then surrounded with nine precious jewels or navaratna. Ananta represents the energy of God in which the universe rests in space. The nine jewels invoke the astrological influence of the nine planets and are composed of a diamond, emerald, ruby, pearl, yellow sapphire, blue sapphire, red coral, cats-eye and jade. A gold lid with the seven continents of the earth engraved on it is placed on top of the box following which the agni-hotra, or sanctification ceremony. During the agni-hotra the priest offers clarified butter, the symbol of religious principles, into the fire, which represents the mouth of the Cosmic Being. Along with the offering of clarified butter five types of grains-rice, wheat, barley, rye and dhal, are also offered with the chanting of mantras. Temple Layout Ancient Scripts on Temple Construction in Hindu Shastras: The Shilpa text Shiva-prakasha in its chapter titled vastu-bhumi-bedha, describes sixteen (Shodasha) types of temple layouts: 1. Square (Chandura); 2. Rectangle (Agatra); 3. Trapezium (with uneven sides – like a cart – shakata); 4. Circle (Vritta); 5. Elliptical (kritta vritta); 6. triangular (dwaja); 7. diamond or rhombus (vajra) ; 8. Arrow (shara);umbrella (chatra) ; 9. fish (meena); 10. back of a tortoise (kurma); 11. conch (shanka); 12. crescent (ardha-chandra); 13. pot (kumbha); 14. sword (khadga); 15. and lotus (kamala).



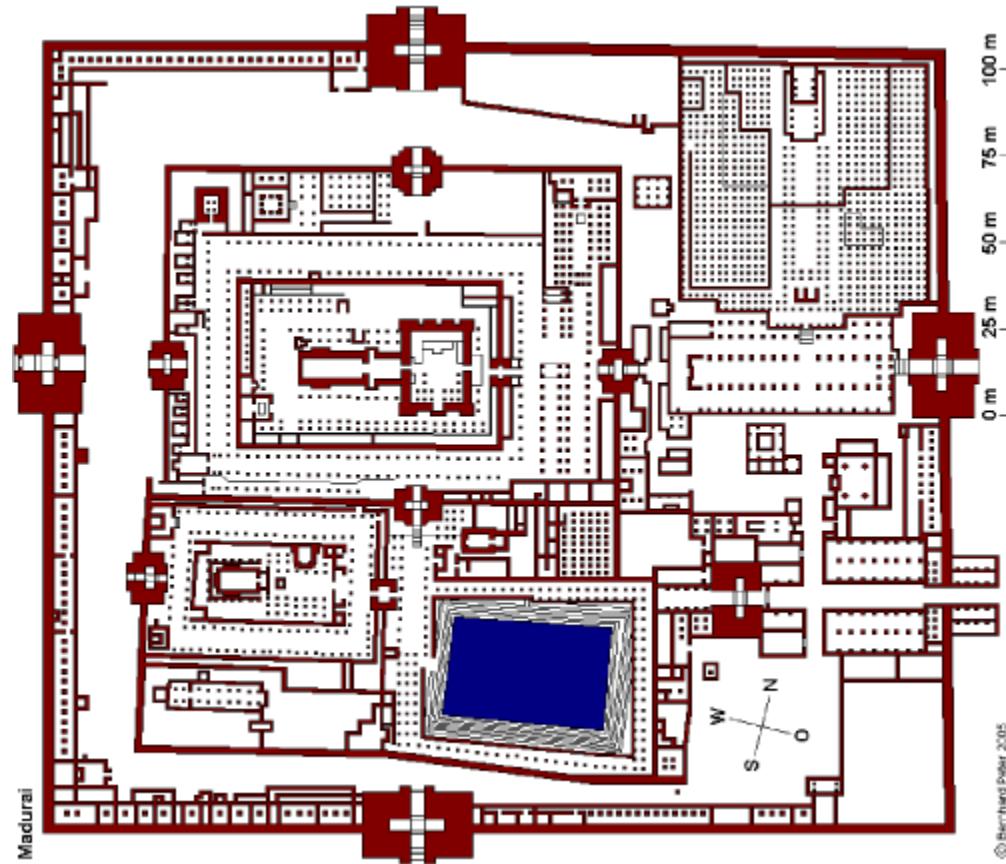
South elevation plan of Kailash temple is Plate LXXXI from the book “Cave temples of India” by Ferguson, James and James Burgess

These layouts have specific applications; and are not to be used generally. For instance: the back of a tortoise (kurma), pot (kumbha), conch (shanka) and lotus (kamala) are recommended only for Vishnu and Shiva temples. Similarly the Square (Chandura), Rectangle (Agatra), fish (meena), diamond or rhombus (vajra) and sword (khadga) are recommended for Devi temples. The rest of the lay outs are for other (lesser) deities. But all texts generally agree that the square or the rectangular shape of layout are the best and most auspicious. Varaha-samhita calls such layouts as Siddha-bhumi, the best of all. In case the layout is rectangular, the North South dimension should be greater than East-west dimension. It is also said, it would be better if the elevation on the west or the South is slightly higher.

The drawing of the court yard of the Shiva temple at Thiruvālangādu, by Tamil illustrator, best known for his detailed renditions of Tamil architecture and sculpture P.M. Sreenivasan (1919-1983), who adopted the name Silpi,

Having determined the suitability of the land for constructing a temple, and having drawn up the Vastu Mandala of the town and identified the temple location ; the next stage is to draw up a construction plan. This specifies the location, the size and the orientation of the various temples to come up in the proposed complex. This again involves preparation of another Vastu Mandala.

Pada Vinyasa: In Vastushastra (architecture means “scheme of plot- or disposition”). This is the name of secondary conceptual instruments, used in the art of ancient Hindu architecture (*vāstuśāstra*). This term is commonly used in literature such as the *Mānasāra*. It is a particular diagram (one only) traced on the building terrain during the padavinyāsa ceremony, before starting the construction. Each square of a diagram is assigned to a different deity. In certain texts, the compartments (*koṣṭha*) of the deposit casket are referred to by the names of deities associated with the plots of the site diagram. In the *Kāsyapaśilpa* there are the letters of the Sanskrit ‘alphabet’ and the names of the eight *Vidyēśvaras* assigned to or placed in the casket at the beginning of the ceremony, which serve as menas of identifying the compartments later on.¹



Temple layout Sreeneevasan's Blog

It is the process under which the Mandala (architectural plan which represents the cosmos) is put to use in site planning and architecture - a method whereby any site can be divided into grids/modules or pada. Depending on the position of the gods occupying the various modules, the zoning of the site and disposition of functions in a building are arrived at. A Mandala They are proportional relationships of the squares and the diagonals. The text first gives a list of thirty-two such schemes.

1. sakala, whole; 2. pecaka, couch; 3. pīṭha, pedestal; 4. mahāpīṭha, great pedestal; 5. upapīṭha, low pedestal; 6. ugrapīṭha, high pedestal; 7. sthanḍila, altar; 8. candita, circumcised; 9. paramaśayika, primal rectiner; 10. āsana, seat; 11. sthāniya, local; 12. deśya, regional; 13. ubhayacandita; twice-circumcised; 14. bhadra, auspicious; 15. mahāsana, great seat; 16. padmagarbha; lotus-womb; 17. triyuta; thrice-yoked; 18.

karṇāṣṭaka, eight-cornered; 19. gaṇita; computed; 20. sūryaviśālaka, extensive as the sun; 21. susamhita, well-endowed; 22. supratikānta, beautiful rival-spouse; 23. viśālaka, capacious; 24. vipragarbha, Brāhmaṇa-womb 25. viśveśa; lord of the world; 26. vīpulahhoga, copious enjoyment; 27. vīprakānta; Brāhmaṇa-spouse 28. viśālākṣa, large-eyed; 29. vīprabhakti, Brāhmaṇa's portion; 30. viśeśasāra, essence of lord of the world, 31. īśvarakānta; lord's spouse, 32. candrakānta, moon's spouse.

Among these thirty-two schemes, only seven are treated in more detail: sakala, single-plot (which does not have much detail, to begin with); pecaka, four-plot; pīṭha, nine-plot; mahapīṭha, sixteen-plot; upapīṭha, twenty-five-plot; maṇḍuka, sixty-four-plot, and paramaśayika, eighty-one-plot, schemes. The further elaboration of these schemes includes the assignment of deities to the plots. The padavinyāsa, placing (marking) of the plots and assigning deities on the floor of the pavilion and on the altar, is conducted next (see Mānasāra chapter 70). He marks either the sthaṇḍila of forty-nine squares or the pīṭha of nine squares with grain powder on the floor of the pavilion. On the altar, he marks either the upapīṭha diagram of twenty-five plots or pīṭha of nine plots. He also marks two circles, one on the floor of the pavilion and the other on the altar. During padavinyāsa, ritual marking of the plots in the delineated site, the sthapati visualizes the form of vāstupuruṣa, man or “spirit” of the site (who “inhabits” it), as lying face down and stretched out across it, while reciting the mantra of obeisance to him. He also visualizes the vāstumāṇḍala, cluster of forty-five deities, who, in order to subjugate vāstupuruṣa, sit upon his limbs and thus occupy plots in the four quarters of the site. He invokes the deity corresponding to each plot and “situates” it thereupon by touching the plot and visualizing its form in all iconic detail and vocalizing its specific venerational mantra.

2) Padavinyāsa scheme of plot-disposition”.—Chapter VII of the Mānasāra is titled Padavinyāsalakṣaṇam, “Characteristics of the Disposition of Plots”. The chapter outlines a number of schemes by which the delineated site is divided into plots. A typical scheme of plot-disposition is a conceptual instrument intended to “order” the delineated site. This tool is constructed out of geometrical and numerical principles of quadratic division. Therefore the number of plots in the scheme is always a perfect square.

Land: The land considered suitable for the purpose of constructing the temple (vastu bhumi) and placed at the center (Brahma Sthana) of the Vastu mandala of the township must be in the shape of a rectangle or a square. The ratio between the breadth and the length of the area may be 4:8; 4:7; 4:6; or 4:5. (The square would be 4:4). Shapes of sites to be avoided are: 1. circular (vṛitta), 2. triangular (trikona), 3. rod shaped (dandakriti), 4. bow shaped (dhanur akara) 5. other irregular shapes. And, in case it becomes necessary to construct a temple on a land of such “un approved” shape, the area meant for the temple should be demarcated and rendered a square or a rectangle in shape. Buddhist and Jain temples too follow the same principles. Even the Sri Harmandir Sahib, the Golden Temple at Amritsar is structured in a square shape; with the Sanctum placed in the Brahma sthana. In case of a rectangular site, it must have north – south orientation. The depth of the site (Aaya-profit) should be more than its breadth (vyaya-loss). That is the reason we find our temple walls (prakara) on north-south shorter than the walls on east-west. The slope of the land surrounding the temple in the east and the north direction should be in the northeast corner. Fountains or lotus ponds of the temple should be in the northeast direction. In the open space surrounding the temple, Tulsi (Basil) plants with raised bed should

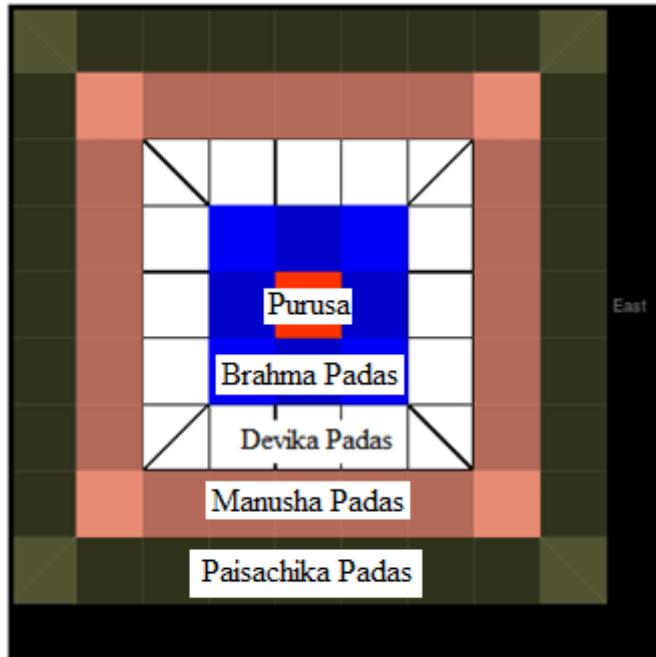
be in the east; the Jasmine, white Champak, Star Coral plants etc. should be in the northwest corner or the east. Four approach roads are much recommended. The preliminaries for construction of a shrine include preparations of a plan, Vastu Purusha Mandala, a Yantra, with unit cells (pada) of 64, 81 or 256 in number. The entire process is rich in symbolism. The square shape of the Mandala is symbolic of earth, signifying the four directions which bind and define it; and the Vastu is the extent of existence in its ordered site; Purusha being the source of existence. The ground plan, again, is symbolic and is the representation of cosmos in miniature. The Vastu Purusha represents terrestrial world with constant movements. The grid made up of squares and equilateral triangles is imbued with religious significance; with each cell belonging to a deity. The position of the deity is in accordance to the importance assigned to him .The central portion of the square (Brahma Sthana) is occupied by the presiding deity of the temple ; while the outer cells house deities of lower order.

Another important aspect of the design of the ground plan is that it is intended to lead from the temporal world to the eternal. The principal shrine should face the rising sun and so should have its entrance to the east. Movement towards the sanctuary, along the east-west axis and through a series of increasingly sacred spaces is of great importance and is reflected in the architecture. This process of drawing the Mandala , known as Pada-vinyasa or Vastu mandala Vinyasa is essential not only for construction of the main temple but also for deciding upon the location, the orientation and the size of the sanctum; and for placement of retinue-divinities. Let us look at the following example of an 81 cell parama-saayika layout.

The site-plan is to be regarded as the body of the Vastu-purusha whose height extends from Pitrah (in the bottom left corner) to Agni (top right corner). The Vastu purusha mandala is in some ways a development of the four pointed or cornered earth mandala having astronomical reference points. The mandala of 81 squares has 32 squares around the border representing the four cardinal points and the lunar constellations. It is the representation of all cyclical time; lunar and solar. Brahma is the God at the centre. The Manduka Mandala (8×8) the whole square would be divided by the two axes that go North-south and East-west.

In the case of Parama Saayika Mandala (9×9)- the entire square would be unevenly divided.

The center of the mandala consisting nine cells is dedicated to Brahma, the first of beings and the engineer of universal order. The Three cells to its east are for Aryaman, three cells to its west are for Mitra and three cells to its north are for Prihvidhara. In this site plan 32 spirits reside in the outer ring. There are 8 spirits in four corners. There are four spirits surrounding Brahma. Thus there are in all 45 spirits (including Brahma). Dikpalas or guardian deities of different quarters, who assist in the affairs of universal management, are an important part of the Vastu. Indra, Agni, Yama, Niritti, Varuna;; Vayu , Kubera and Isana; reside in the East , South-East , South, South-West, West, North-West, North and North-East respectively. All except Kubera are principal Vedic deities. This provides a method that determines the requirements of architecture in relation to its directions. Establishing Vastu Mandala on the site The vastu-purusha-mandala, forming a sort of map or diagram of astrological influences that constitute the order of the universe, is now complete. When placed on the building site the vastupurusha-mandala determines the positions and orientations of the temples and the time for



commencing the construction. Only by the combination of the vastu-purusha-mandala and the astrological calculations can this factor be ascertained. Horizontal and vertical dimensions: From the diagram of the vastu-purusha-mandala the architect next proceeds to develop the vertical and horizontal dimensions of the temple. The square, the rectangle, the octagon and the pentagon are fundamental patterns in the horizontal or ground plan. In the vertical alignment the pyramid, the circle and the curve are more prominent. The subdivisions of the ground plan include thebrahmasthana (the main shrine and smaller chapels) and the mantapa(balconies, assembly halls and auditoriums).

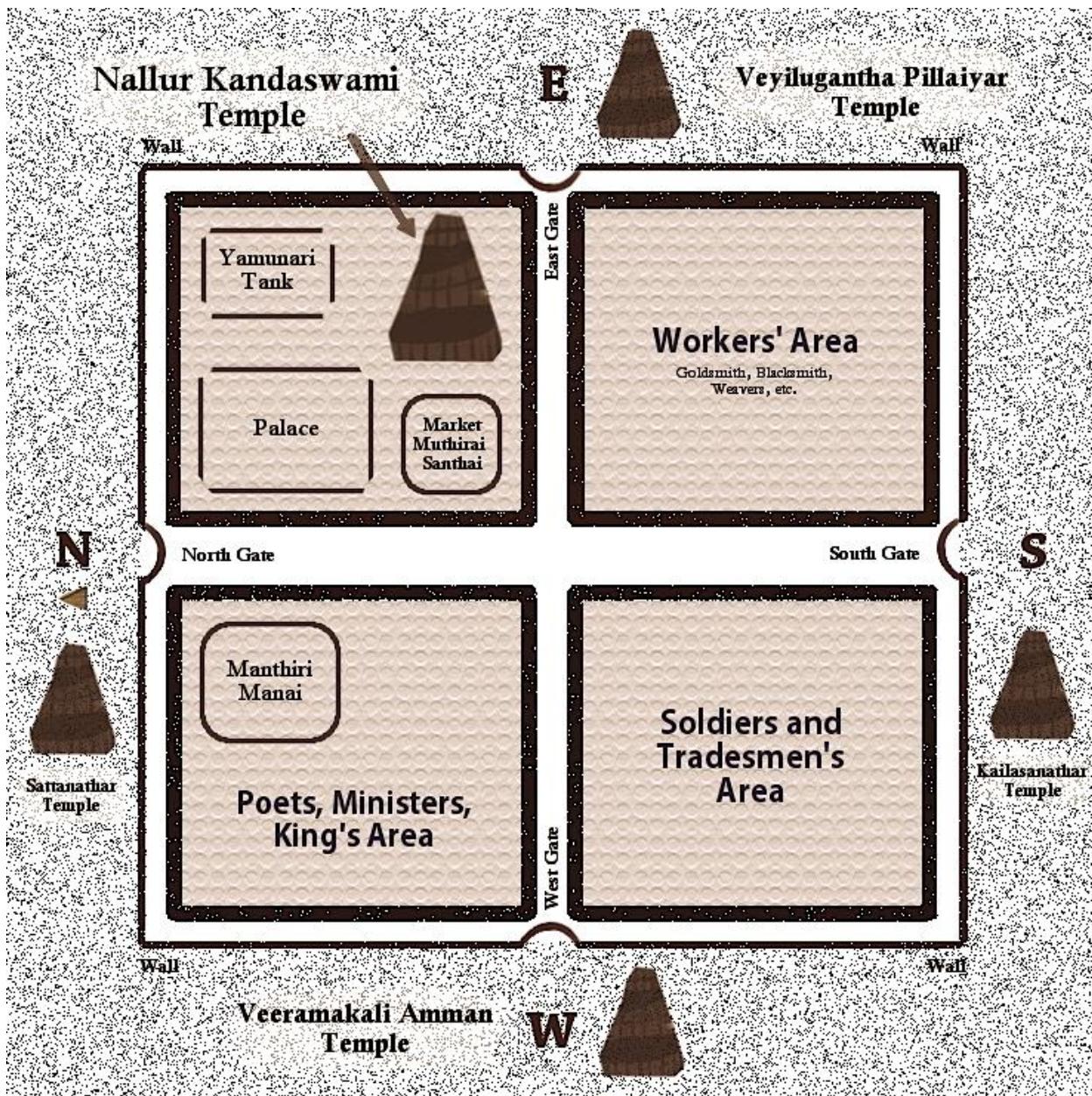
The vertical plan consists of drawings for the gopura (entrance ways), the vimana (the structure above the main shrine or chapel) and the prakara (the walls). The construction of the temple follows in three dimensional forms, in exactly the patterns laid out by the mandala. The relationship between the underlying symbolic order and the actual physical appearance of the temple can best be understood by viewing it from above (top elevation). In order to establish the vastu-purusha-mandala on the construction site, it is first drafted on planning sheets and later drawn upon the earth at the actual building site. The ground for civil construction is demarcated by dividing the site into 81 cells, by drawing 10 lines from East to West and 10 lines from North to South in which Vastu Mandala deities are installed. In addition the deities of the Sarvathobhadra-mandala are also established after performing Vastu Homa. The drawing of the mandala upon the earth at the commencement of construction is a sacred rite in itself. The cells sustain the temple in their own sphere of effectiveness, in the manner that the actual foundation supports its weight. Vastu Shanti Puja is a spiritual and religious process to offer prayers to the Vastu Purush who is the Lord, protector and soul of the house and seek the blessings for positivity and prosperity. During this worship, people also pay their tribute to the deity of directions, five elements of nature, and natural forces. Some of the major objectives of performing Vastu Shanti Pooja are – To eliminate any kind of faults relating to interiors exteriors, or structures of buildings. To seek forgiveness of God for the damage done to the

nature during construction. To ask for the blessings of Vastu Purush for happiness, wealth and good health. Offer prayers to Vastu Purush for protection of home or office from natural calamities. To appease any form of supernatural force which might be dangerous for the occupants

Significance of Vastu Shanti Puja Vastu is a place where nature and human beings live together in harmony. Vastu Shanti Puja, also known as Vastu Dosh Nivaran Puja, brings a striking balance between both of them by removing all the hurdles or negativities present in the environment and preventing unforeseen destruction and misfortune to finally improve the Vastu of a place. The puja is performed to appease Vastu Devta to seek his blessings and bless one's home or workspace with prosperity and harmony. Vastu Puja is also conducted to reduce the harmful impacts of the Vastu Dosha caused by the construction faults in the Vastu of a place and to maintain a balance between the eight directions and the five elements of nature. People worship Vastu Purush or Vastu deva on several occasions such as land worship, Griha Pravesh, door installation, well mining, foundation laying, foundation mining, and others.

Garbadhana, Shilanyasa is the ceremony for laying foundation stone. It is the laying of the first stone (square in shape) or a brick signifying the start of construction. It is laid in the north-western corner of the building plan, drawn on the ground. After this, the construction of the foundation is taken up. The foundation is built and the ground filled up, up to the plinth level, except in the middle portion of the garbhagraha area, which is filled up three-fourths. The sanctum is technically known as Garba-Griha. This part of the temple is usually constructed first. The ceremony related to it is known as Garba-dana or Garba-nasya; and, it involves letting in to the earth a ceremonial copper pot, containing nine types of precious stones, several metals, minerals, herbs and soils symbolizing creation and prosperity. The following is a little more detail about it.

The Brahmasthana, the principal location in a temple where the Garbagraha will eventually come up, is the nucleus of the Vastu Purusha Yantra. At thebrahmasthana, as drawn on the grounda ritual is performed calledgarbadhana, inviting the soul of the temple (Vastu Purusha) to enter within the buildings confines. In this ritual, a golden box is imbedded in the earth. The interior of the box is divided into smaller units exactly resembling thevastu-purusha-mandala. All the units of the gold box are first partially filled with earth. In the thirty-two units representing the nakshatras (lunar mansions), the units of Brahma and the twelve sons of Aditi, the priest places an appropriate mantra in written form to invoke the presence of the corresponding divinity .An Image of Ananta , the hooded serpent , is also placed in the box. Ananta, meaning eternal or timeless, also represents theenergy that supports the universe. The box also contains nine precious stones – diamonds, emeralds, rubies, pearls, yellow sapphire, and blue sapphire, red coral, cats-eye and jade – to appease the nine planets. A stone slab (adhara- shila) is thereafter placed over the spot the copper pot is buried.And, over this slab will rise the foundation for installing the Mula-bhera.



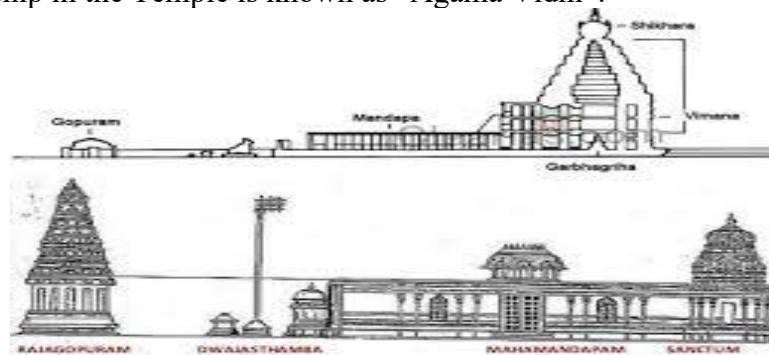
The copper pot signifies the womb; and icon the life arising out of it. The sanctum constructed around it is the body. That pot represents the roots of the “temple-tree”; and the icon its sap. The four walls around the icon represent the branches spreading around. The structure of the Vimana rises above it in a series of tiers. The roof resting over the walls is called Kapotha, meaning where the doves rest. The imagery suggested is that of a tree with birds perched on its branches. The sanctum is thus a model of a growing tree. Another set of symbolism is that the foundation of the temple represents the Earth (prithvi); the walls of the sanctum the water (apaha); and the tower over it the fire (tejas). The final tier of the Vimana is air (vayu) and above it is the form-less space (akash). The sanctum is thus a constellation of five elements that are basic building blocks of all existence. Once the garbadhana and agni-hotra ceremonies are complete the actual construction of the temple commences according to the plan. When the foundation is finished the vertical structure is raised. The external features of the temple are

brought to life through finely sculpted figures and paintings. The art and sculpture frequently portray the forms of divine entities and the different stages of consciousness in the gradual evolution of life throughout the universe. It is believed that the Vastu Purusha sleeps during Bhadrapada, Ashvijya and Karhika months facing east. During Margashira, Pushya and Magha months he sleeps facing south; In phalgun, Chaitra and Vaishaka, he sleeps facing west. And, in Jeysta Ashada and Shravana, he sleeps facing north. The doors facing towards those directions are fixed in the respective months.

Temple Layout and its symbolism The Agama Shastras say that the Temple structure is a mini cosmos. The Temple entrance should face east – the direction of the Rising Sun. The ideal Temple should have at least one entrance, an ArdhMandapa, a Mandapa or a large hall, a Garba-Griha and a Shikara directly above the Garbha-Griha. The design comprises:

1. A Towering structure called the Rajagopuram (pyramid in pattern) on the Eastern side at the entrance to the Temple.
2. A Dwajasthamba (pillar) in line with the main shrine immediately after the Rajagopuram.
3. Near the Dwajasthamba is a lotus shaped pedestal for offerings, called the Balipeeta.
4. A large Mandapa or hall for assembly of devotees.
5. The passage through the Mandapa leads to the “Garba-Griha” (womb chamber) where the Main Deity is installed.
6. Ardh Mandapa adjacent to the main Mandapa and before the “Garba-Griha”.
7. The Main Deity faces East word inside and the Garba-Griha is located inside a structure or sanctuary called the “Vimana”.
8. The pyramidal or tapering roof over the Deity is called “Shikara” or “Gopuram” which is a dome.
9. There is a circumnubating passage or “Pradakshira Patha” around the Garba Griha and Mandapa.

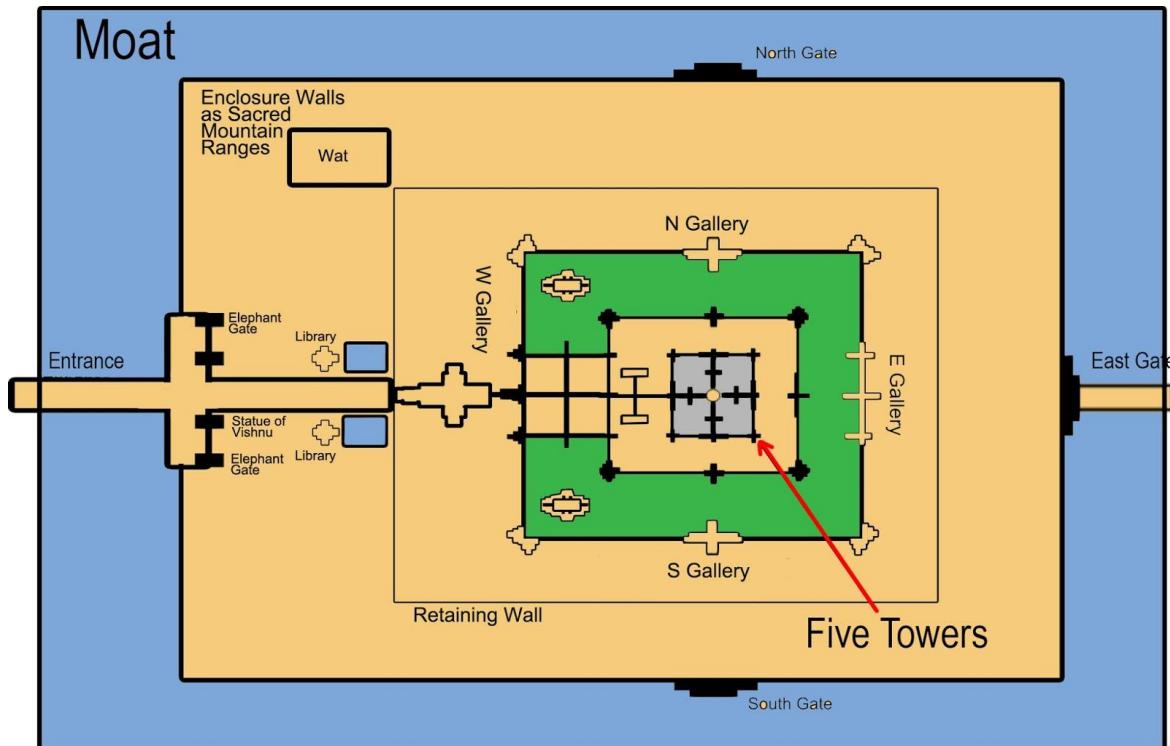
The above design applies both to the “Shiva” and “Vaishnava” Temples with small variations. Architecture is otherwise called “Shilpa” and the one who constructs the Temple is called a “Sthapathi”. The “Sthapathi” is an expert in Temple architecture and idol creation. The procedure of worship in the Temple is known as “Agama Vidhi”.



1. **TEMPLE LAYOUT :** The basic purpose of Hindu temple is to give shelter for a deity and to facilitate its worship by its devotees . The style and Architecture of a Hindu temple is a symbol of Hindu. The Hindu temple is laid out on an east-west alignment; the temple entrance is on the eastern side and the sanctuary is on the western side. The entire temple complex is placed on a high plinth or platform to symbolize its significance. Vaikanasagamas and the silapashastras stipulate the rules for the selection of the site and construction of the temple buildings. Most of the temple adhere to this rule. The Indian

temple architecture also seems to be based on the concept of main shrine as being composed of multiple images of small shrines normally leading up to the building us of towering the super structure. The region wise categories have got the following distinguishing characteristic features. Region Architectural shape Presiding god/deity North India Nagara Square Brahma South India vesara Circular Siva Far south Octagonal Vishnu The temple type that is popular in the Tamil country is the octagonal Dravida-Vimana which is also known as Dravida-Satanga-Vimana. This type consists of six important parts from the base to the final. These six parts are linked to the angas of human beings. There are 1. upapitha, 2. adhisthana, 3. pada or bhiti, 4. prastara, 5. sikhara and 6. griva (Kalasa) humans parts are as follows. Upapitha : Feet Adhisthana : Thigh , up to hip Pada : Forso Prastara : Head Griva(Kalasa) : Neck (top knot) The upapitha and adhisthana constitute the basement. The upapitha is an additional part meant to increase the height of the basement.The pada or bhiti is the wall part of htehouse that houses themulbera. It is fitters with additional architectural moldings such as the kumbha panjara and kostha panjara that add to the aesthetics of the edifice. The kumbhapanjara is of the shape of the full pitheher at its base and is an architectural addition. The kosthapanjara houses Avaranamurts.

2. WALLED TEMPLE ENCLOSURE This is a unique feature of the South India temple style. Temples are usually encircled by protective, concentric enclosure walls, with entrances through large gateways (called gopurams) that sometimes even dwarf the enclosed temples. This walled design was perhaps precipitated by the increased fragility of Hindu empires in the wake of ongoing Islamic



Angkor layout

invasions that jeopardized the sacred structures of their civilization. As a result, the temple complex came to include not only the temple, but also the surrounding city itself. Accordingly, the temple cities now even more accurately symbolized the divine city surrounded by its mountain ranges (city walls). **PRIMARY STRUCTURES** The chief temple structures (moving from east to west) include: Ardha-mandapa. This is a largely open entrance vestibule, entered by passing under a gopuram (arched gateway), symbolic of the passage from the world of the profane to the sacred. Temple-goers ascend stairs, pass under the gopuram to the level of the ardha-mandapa, and then proceed into the mandapa. Mandapa. The mandapa is positioned directly between the entrance vestibule and the garbhagriha; it is a columned or hypostyle hall, in which devotees assemble (to view the deity in the garbhagriha) and ritual dances are performed. Some more advanced temples will have a second mandapa — called the maha mandapa — that is located in between the external mandapa and the garbhagriha. Garbhagriha. The square-shaped garbhagriha holds the core sanctuary, cella, or Holy of Holies where the resident deity resides. The vimana, the main tower of the temple, sits directly above the garbhagriha. The images since the early Chola period that decorate the koothapanjara are the following Ardha-mandapa South Ganapathi Garbhagrha South Dakshinamurti Garbhagraha West Lingodbhavamurthi Far south Octagonal Vishnu Vishnu (or) Ardhanarisvara Garbhagraha North Brahma Ardhamandapam north Mahissuramardini In view of the six-fold division of the Hindu temple in its vertical order in comparison with the human angas. It is called parusa. That is to say the temple is equal to that of the cosmic man virat purusa or human form. In its horizontal order of the temple site is divided into a number of squares that is called Vastupurusa. Therefore the Hindu temple is Vastupurusa.

3. THE SQUARE AND CIRCLE: The square sanctuary (garbhagriha) is the core of the temple complex, positioned directly under the mountain tower (vimana); it houses the resident deity. The overall plan of the temple is dictated by this central square, as its form is mirrored by surrounding structures. To return briefly to cosmology: The square form is associated in Hinduism with divinity (hence the square sanctuary), whereas the circle is associated with humanity. The transition from profane (circle) to sacred (square) is most profoundly indicated by the half-circle stones positioned at the base of the entrance stairways to temples' ardha-mandapas. It is interesting to note that the apsidal

form used as the floorplan for Buddhist sanctuaries (chaitya) fuses the circular with the square; this was likely the inspiration for the use of these basic, symbolic architectural forms.

4. MOUNT of the God AT THE ENTRANCE The approach to the temple entrance (ardha-mandapa) is indicated by the presence of the resident divinity's mount or transport: Temples venerating Shiva (and his consort, Parvati) display stone images of his mount, Nandi (a seated bull), facing the main shrine. Temples dedicated to Vishnu (and his consort, Lakshmi) display stone images of his mount, Garuda (a mythical bird), facing the main shrine.

There are often three entrances to the South India temple, on the east, north, and south sides of the external ardha-mandapa. This compares versus the Northern temple's single eastern entrance. The progression of rooms follows the same pattern as in the North: the internal mandapa is shown in yellow highlights and the garbhagriha sanctuary is shown in red highlights. Vast hypostyle halls. Later in the Southern style's development, the internal mandapa was replaced by

vast hypostyle halls, with as many as one thousand pillars. Later, even the external ardhamandapa was expanded, becoming a small hypostyle hall that fed an even larger one.

5. SOUTHERN STYLE TEMPLE, The Southern style's tower exhibits sharp vertical sides that proceed to the summit in a series of diminishing storey's to form a pyramidal outline (rather than a curved, corn cob like shape). This is perhaps the most easily identifiable feature of the Southern style temple. Further, the clearly visible horizontal lines indicative of the storeys contrast with the Northern style's strong vertical lines. The tower shape was originally inspired by Buddhist vihara monastery antecedents — specifically, the parapets (discussed below) represent the cells around a square shaped room in which Buddhist monks were allowed to sleep. This core "cell-surrounded square" form is merely superimposed in ever-smaller layers until the desired temple height is achieved.

6. HINDU TEMPLE IN TAMILNADU The Hindu temple in Tamil Nadu was an evolving phenomenon since the pallava to the Vijayanagara Nayaka period. The simple vimana on the Mamallapuram beach(the mukunda Nayanar Temple) has a micro structure which became a macro during the Nayaka period as the temple in Srirangam. Madurai and Tiruvanamalai are the early temples consists of the six vertical parts (Upapitha to kalasa) and the basic plan includes the garbhagraha antarala and Mukhamandapa. From the pallava to Nayaka period a lot of development took place both vertically and horizontally in the format of the Hindu temple building. A number of gopuras, mandapas, subsidiary chapels, tirthas, vahanas and so on were added. The micro gopura that peeps in the kailasanatha temple at Kanchi acquire a pyramidal proportion in the latter temples at Srirangam, Madurai and Tiruvanannamalai .

Gopuras were set in all cardinal directions and at the entry of each prakara, the total number reaching its peak in the Srirangam and Madurai temples. Mandapas of intricate workmanship were in various locations. These catered to the needs of the increasing utsavas; Kalyanamandapa for holding the marriage festival s and Vasantamandapa for holding the spring festival. Subsidiary chapel were added for Devis,Nandi,Garuda, Acaryas and so on. A number of uhanas for processional purpose were added. In short, the Hindu temple reached the optimum level of its evolution under the Nayakas in the Tamil country. Against this background the temple chosen or the present study are examined.

The Temple is not only a home of God but his representation in the structure of temple which resembles human form. The symbolism of the temple plan and elevation suggests that the garbhagrha represents the head and the gopuram the feet of the deity. Other parts of the building complex are identified with other parts of the body. For instance, the sukanasi or ardhamantapa (the small enclosure in front of the garbhagrha) is the nose; the antarala (the passage next to the previous one, leading to passage next to the previous one, leading to the main mantapa called nrttamantapa) is the neck; the various mantapas are the body; the prkaras (surrounding walls) are the hands and so on. Vertically, the garbhagrha represents the neck, the sikhara (superstructure over the garbhagrha) the head, the kalasa (finial) the tuft of hair (sikha) and so on.

Another interesting symbolism is that when a devotee enters the temple, he is virtually entering into a mandala and therefore participating in a power-field. His progress through the pavilions to reach the sanctum is also symbolic. It represents the phases of progress in a man's journey towards divine. In accordance with this scheme, the architectural and sculptural details vary from

phase to phase ; gradually leading him to the experience, which awaits him as he stands in front of the deity in the sanctum. This is explained in the following way. On reaching the main gateway, a worshipper first bends down and touches the threshold before crossing it. This marks the transition from the way of the world to the world of God. Entering the gateway, he is greeted by a host of secular figures on the outer walls; representing the outward and diverse concerns of man. As he proceeds, the familiar mythological themes, carved on the inner walls attune his attitude. The immediate pavilion and vestibule near the sanctum are restrained in sculptural details and decorations; these simpler motifs and the prevailing semi darkness help the worshipper to put aside distractions and try focusing his attention on the sanctum. Finally the shrine, devoid of any ornamentation, and with its plainly adorned entrance, leads the devotee further to tranquility, to fulfilment and to the presence of God. The garbhagriha is usually surrounded by a circumambulatory path, around which the devotee walks in a clockwise direction. In Hindu and Buddhist thought, this represents an encircling of the universe itself. Positions and orientations of the temples. The following plan indicates the position of gods and goddesses in an 81 celled temple-site. This plan relates to construction of a Vishnu temple.

Atri Samhita (2.38.42) prescribes that the central Brahma bagha must be divided into four equal parts and the main shrine facing east must be located on the North-western side thereof. The shrine must have five sanctums, to house five forms of Vishnu; and the shrine should have three stories. The icon of Vishnu , the principal object of worship, may be represented in the shrine in one of his many forms . It could be single (eka-murti-vidana) or many (aneka-murti-vidana). The aneka forms might be : 5 (pancha murti); 6 (shan murti); or 9 (nava murti). The opening of the sanctum on the Eastern side is preferred , specially in a shrine dedicated to Vishnu. The shrine must never have a door in the intermediate direction (Vidik)- Atri Samhita (2.3233) And, generally, the doorway to the East is the best , most auspicious (utta-mottamam) ;to the West is next best (uttama); to the South is middling (madhyama); and, to the North is not desirable (adhama) – Vimanarchana kalpa (patala 3)

Chapter 2

The Importance of 4

Remains of early elliptical shrines discovered in Besnagar (3rd-2nd century BCE) and Nagari (1st century BCE), may be the earliest known Hindu temple structures, associated to the early Bhagavata tradition, a precursor of Vaishnavism.

In Besnagar, the temple structures have been found in conjunction with the Heliodorus pillar dedicated to Vāsudeva. The archaeologists found an ancient elliptical foundation, extensive floor and plinth produced from burnt bricks. Further, the foundations for all the major components of a Hindu temple – *garbhagriha* (sanctum), *pradakshinapatha* (circumambulation passage), *antarala* (antechamber next to sanctum) and *mandapa* (gathering hall) – were found. These sections had a thick support base for their walls. These core temple remains cover an area of 30 x 30 m. The sections had post-holes, which likely contained the wooden pillars for the temple superstructure above. In the soil were iron nails that likely held together the wooden pillars. The superstructure of the temple was likely made of wood, mud and other perishable materials.

This poses an interesting question: did the design of the temples take after the Greeks invaded India and settled in parts making these their own? Some converting to Hinduism and some to Buddhism?

Following the conquests of Alexander the Great, from the end of the 4th century BCE to the first centuries of the common era, the Greeks in effect maintained a political presence at the doorstep, and sometimes within India, down to the 1st century CE with the Greco-Bactrian Kingdom and the Indo-Greek Kingdoms, with many noticeable influences on the arts of the Maurya Empire (c.321–185 BCE) especially. Hellenistic influence on Indian art was also felt for several more centuries during the period of Greco-Buddhist art.

Pre-Hellenistic influences (518–327 BCE)

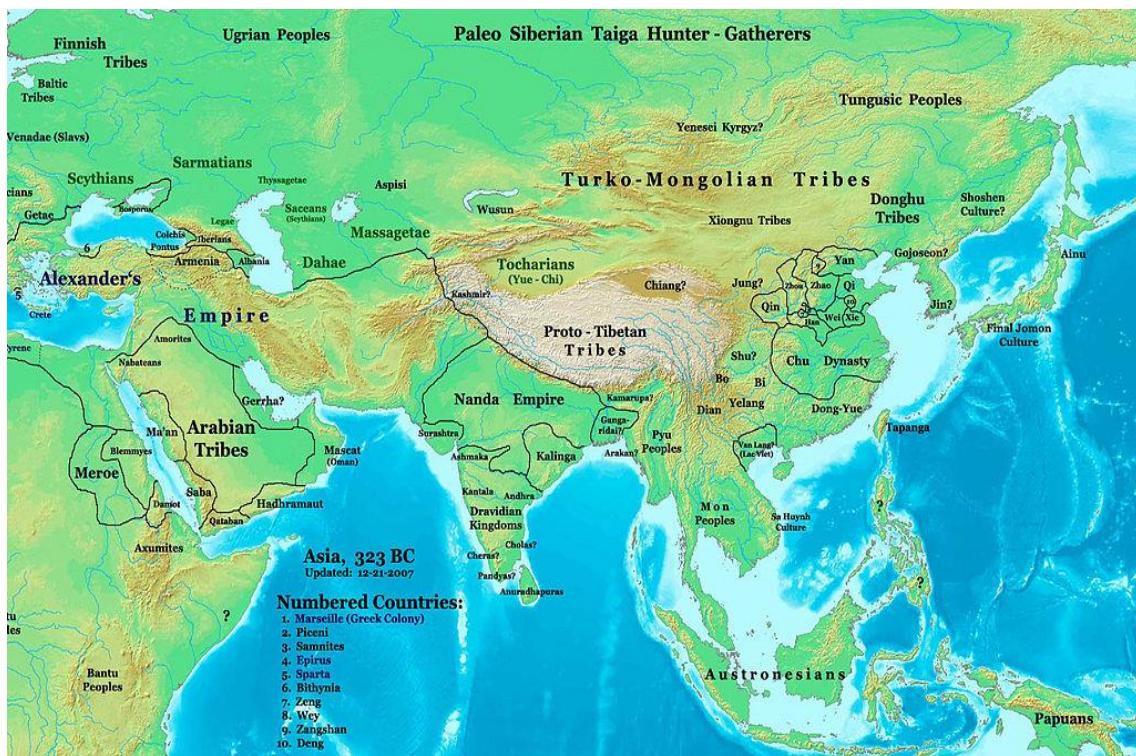
Greek coins from the 5th and 4th centuries BCE were circulating in the area

Hellenistic period (327 BCE onward)

The Greek campaigns in India under Alexander the Great were limited in time (327–326 BCE) and in extent, but they had extensive long term effects as Greeks settled for centuries at the doorstep of India. Soon after the departure of Alexander, the Greeks (described as Yona or Yavana in Indian sources from the Greek "Ionian") may then have participated, together with other groups, in the armed uprising of Chandragupta Maurya against the Nanda Dynasty around 322 BCE, and gone as far as Pataliputra for the capture of the city from the Nandas. The Mudrarakshasa of Visakhadutta as well as the Jaina work Parisishtaparvan talk of Chandragupta's alliance with the Himalayan king Parvatka, often identified with Porus. According to these accounts, this alliance gave Chandragupta a composite and powerful army made up of Yavanas (Greeks), Kambojas, Shakas (Scythians), Kiratas (Nepalese), Parasikas (Persians) and Bahlikas (Bactrians) who took Pataliputra.

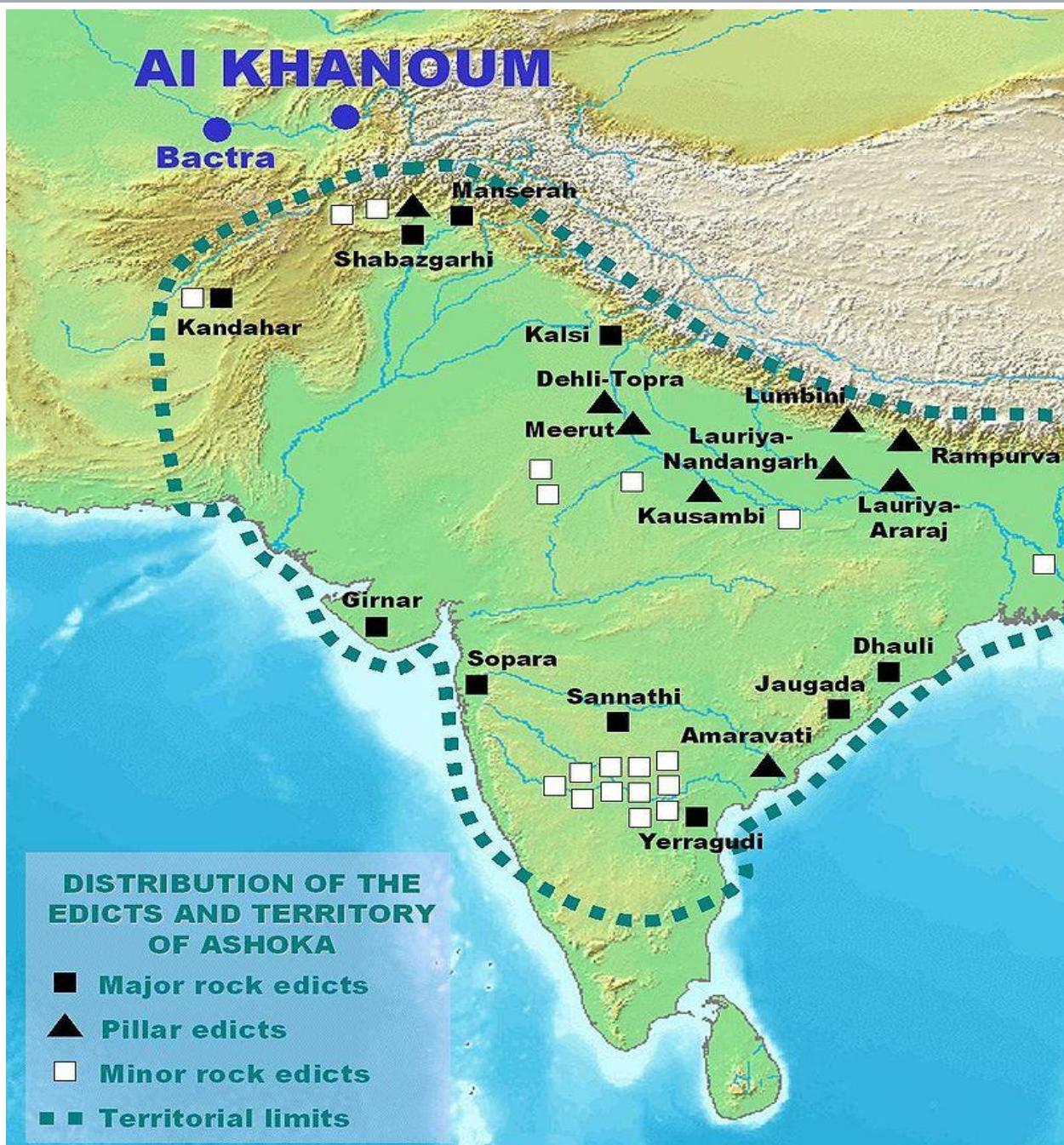
After these events, the Greeks were able to maintain a structured presence at the door of India for about three centuries, through the Seleucid Empire and the Greco-Bactrian kingdom, down to the time of the Indo-Greek kingdoms, which ended sometimes in the 1st century CE. During that time, the city of Ai-Khanoum, capital of the Greco-Bactrian Kingdom, and the capitals of the Indo-Greek Kingdom, the cities of Sirkap, founded in what is now Pakistan on the Greek Hippodamian grid plan, and Sagala, now located in Pakistan 10 km from the border with India, interacted heavily with the Indian subcontinent. It is considered that Ai-Khanoum and Sirkap may have been primary actors in transmitting Western artistic influence to India, for example in the creation of the quasi-Ionic Pataliputra capital or the floral friezes of the Pillars of Ashoka. Numerous Greek ambassadors, such as Megasthenes, Deimachus and Dionysius, stayed at the Mauryan court in Pataliputra.

The scope of adoption goes from designs such as the bead and reel pattern, the central flame palmette design and a variety of other moldings, to the lifelike rendering of animal sculpture and the design and function of the Ionic anta capital in the palace of Pataliputra.^[14] After the 1st century CE, Hellenistic influence continued to be perceived in the syncretic Greco-Buddhist art of Gandhara, down to the 4th–5th centuries CE. Arguably, Hellenistic influence continued to be felt indirectly in India arts for many centuries thereafter.



Asia in 323 BCE

Influence on Indian monumental stone architecture (268–180 BCE)



The Greco-Bactrian Kingdom and the Hellenistic city of Ai-Khanoum were located at the very doorstep of India.

The Indo-Greek Kingdom (or sometimes Graeco-Indian Kingdom) covered various parts of the northwest and northern Indian subcontinent from 180 BCE to around 10 CE, and was ruled by a succession of more than thirty Hellenistic kings, often in conflict with each other. The

kingdom was founded when the Greco-Bactrian king Demetrius invaded India in 180 BCE, ultimately creating an entity which seceded from the powerful Greco-Bactrian Kingdom centered in Bactria (today's northern Afghanistan). Since the term "Indo-Greek Kingdom" loosely describes a number of various dynastic polities, it had numerous capitals, but the city of Taxila in northern Pakistan was probably among the earliest seats of local Hellenic rulers, though cities like Pushkalavati and Sagala (apparently the largest of such residences) would house a number of dynasties in their times, and based on Ptolemy's *Geographia* and the nomenclature of later kings, a certain Theophila in the south was also probably a satrapal or royal seat at some point.

During the two centuries of their rule, the Indo-Greek kings combined the Greek and Indian languages and symbols, as seen on their coins, and blended ancient Greek, Hindu and Buddhist religious practices, as seen in the archaeological remains of their cities and in the indications of their support of Buddhism. The Indo-Greek kings seem to have achieved a level of cultural syncretism with no equivalent in history, the consequences of which are still felt today, particularly through the diffusion and influence of Greco-Buddhist art.

The Indo-Greeks ultimately disappeared as a political entity around 10 CE following the invasions of the Indo-Scythians, although pockets of Greek populations probably remained for several centuries longer under the subsequent rule of the Indo-Parthians and Kushans.

Preliminary Greek presence in India

In 326 BCE Alexander the Great conquered the northwestern part of the Indian subcontinent as far as the Hyphasis River, and established satrapies as well as several cities, such as Bucephala, until his troops refused to go further east. The Indian satrapies of the Punjab were left to the rule of Porus and Taxiles, who were confirmed again at the Treaty of Triparadisus in 321 BCE, and remaining Greek troops in these satrapies were left under the command of the general Eudemus. Sometime after 321 Eudemus toppled Taxiles, until he left India in 316 BCE. Another general also ruled over the Greek colonies of the Indus: Peithon, son of Agenor, until his departure for Babylon in 316 BCE, and a last one, Sophytes, seems to have ruled in northern Punjab until around 294 BCE.

According to Indian sources, Greek ("Yavana") troops seem to have assisted Chandragupta Maurya in toppling the Nanda Dynasty and founding the Mauryan Empire. By around 312 BCE Chandragupta had established his rule in large parts of the northwestern Indian territories as well. In 303 BCE, Seleucus I led an army to the Indus, where he encountered Chandragupta. The confrontation ended with a peace treaty, and "an intermarriage agreement" (Epigamia, Greek: Επιγαμία), meaning either a dynastic marriage or an agreement for intermarriage between Indians and Greeks. Accordingly, Seleucus ceded to Chandragupta his northwestern territories as far as Arachosia and received 500 war elephants (which played a key role in the victory of Seleucus at the Battle of Ipsus):

"The Indians occupy [in part] some of the countries situated along the Indus, which formerly belonged to the Persians: Alexander deprived the Ariani of them, and established there settlements of his own. But Seleucus Nicator gave them to Sandrocottus in consequence of a marriage contract, and received in return five hundred elephants." Strabo 15.2.1(9)

Also several Greeks, such as the historian Megasthenes followed by Deimakos and Dionysius, were sent to reside at the Mauryan court. Presents continued to be exchanged between the two rulers.

On these occasions, Greek populations apparently remained in the northwest of the Indian subcontinent under Mauryan rule. Chandragupta's grandson Ashoka, who had converted to the Buddhist faith declared in the Edicts of Ashoka, set in stone, some of them written in Greek, that Greek populations within his realm also had converted to Buddhism:

"Here in the king's domain among the Greeks, the Kambojas, the Nabhakas, the Nabhapamkits, the Bhojas, the Pitinikas, the Andhras and the Palidas, everywhere people are following Beloved-of-the-Gods' instructions in Dharma." Rock Edict Nb13 (S. Dhammika).

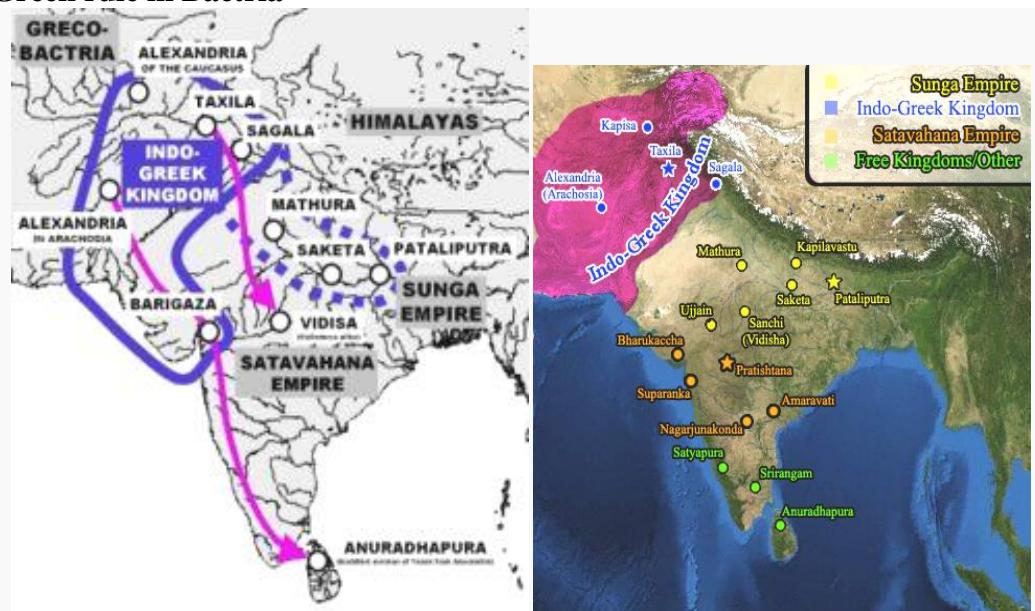
In his edicts, Ashoka claims he sent Buddhist emissaries to Greek rulers as far as the Mediterranean (Edict No13), and that he developed herbal medicine in their territories, for the welfare of humans and animals (Edict No2).

The Greeks in India even seem to have played an active role in the propagation of Buddhism, as some of the emissaries of Ashoka, such as Dharmaraksita, are described in Pali sources as leading Greek (" Yona") Buddhist monks, active in Buddhist proselytism (the Mahavamsa, XII). It is also thought that Greeks contributed to the sculptural work of the Pillars of Ashoka.

Again in 206 BCE, the Seleucid emperor Antiochus led an army into India, where he received war elephants and presents from the king Sophagasesenus:

"He (Antiochus) crossed the Caucasus (Hindu Kush) and descended into India; renewed his friendship with Sophagasesenus the king of the Indians; received more elephants, until he had a hundred and fifty altogether; and having once more provisioned his troops, set out again personally with his army: leaving Androsthenes of Cyzicus the duty of taking home the treasure which this king had agreed to hand over to him." Polybius 11.39

Greek rule in Bactria



Greco-Bactrian statue, Ai Khanoum, Bactria, 2nd century BCE

Alexander also had established in neighbouring Bactria several cities (Ai-Khanoum, Begram) and an administration that were to last more than two centuries under the Seleucids and the Greco-Bactrians, all the time in direct contact with Indian territory.

The Greco-Bactrians maintained a strong Hellenistic culture at the door of India during the rule of the Mauryan empire in India, as exemplified by the archaeological site of Ai-Khanoum. When the Mauryan empire was toppled by the Sungas around 185 BCE, the Greco-Bactrians expanded into India, where they established the Indo-Greek kingdom.

During the Maurya period (c. 321–185 BCE), and especially during the time of Emperor Ashoka (c.268–232 BCE), Hellenistic influence seems to have played a role in the establishment of Indian monumental stone architecture. Excavations in the ancient palace of Pataliputra have brought to light Hellenistic sculptural works, and Hellenistic influence appear in the Pillars of Ashoka at about the same period.

There were Hellenistic influences on Indian stone architecture but the sites and sources of these influences are not always properly identified. Three broad theories have been proposed.

1. One was held by early scholars such as Percy Brown in which stone Indian architecture used immigrant craftsmen experienced in the Persian Achaemenid imperial style, which included much Greek input, to which further more direct Hellenistic influence was added.
2. The second was held by later scholars such as John Irwin who favour mostly indigenous Indian inspiration, and a third held by S.P. Gupta and others, who favour a combination.

Boardman compares the appearance of stone architecture in Persia and India; to some extent the new empires of the Achaemenids and Mauryans faced similar issues in "creating stone architecture suitable to the aspirations of empire", when neither country had a tradition of building in stone. Persian conquests had included areas with important traditions of large-scale building in brick or stone; in India there was probably a tradition of large and intricate building in wood, although remains of this are naturally very few. It is possible that the difficult pass through the Hindu Kush and locations to the northwest of it such as Ai-Khanoum, a Greek city of Bactria in 3rd-century BCE and about 600 kilometres (370 mi) from Kabul, could have provided the conduit to connect the Hellenistic and Indian artists. Alternatively, the influence could have come from the ancient Persian Persepolis, now near Shiraz in southwest Iran and about 2,200 kilometres (1,400 mi) from Kabul. However, a major issue that this proposal faces is that Persepolis was destroyed about 80 years before the first Buddhist stone architecture and arts appeared. This leaves the question whether, to what extent and how knowledge was preserved or transferred over the generations between the fall of Persepolis (330 BCE) and the rise of Ashokan era art to its east (after 263 BCE).

3. Numerous contacts have been recorded between the Maurya Empire and the Greek realm. Seleucus I Nicator attempted to conquer India in 305 BCE, but he finally came to an agreement with Chandragupta Maurya, and signed a treaty which, according to Strabo, ceded a number of territories to Chandragupta, including large parts of what is now Afghanistan and Pakistan. A "marital agreement" was also concluded, and Seleucus received five hundred war elephants, a military asset which would play a decisive role at the Battle of Ipsus in 301 BCE.

Later, numerous ambassadors visited the Indian court in Pataliputra, especially Megasthenes to Chandragupta, later Deimakos to his son Bindusara, and later again Ptolemy II Philadelphus, the ruler of Ptolemaic Egypt and contemporary of Ashoka, is also recorded by Pliny the Elder as having sent an ambassador named Dionysius to the Mauryan court. Ashoka made communications with Greek populations on the site of Alexandria Arachosia (Old Kandahar),

using the Kandahar Bilingual Rock Inscription or the Kandahar Greek Inscription. The Greco-Bactrian Kingdom with its capital of Ai-Khanoum maintained a strong Hellenistic presence at the doorstep of India from 280–140 BCE, and after that date went into India itself to form Indo-Greek kingdoms which would last until the 1st century CE. At the same time, Ashoka wrote some of his edicts in Greek, and claimed to have sent ambassadors to Greek rulers as far as the Mediterranean, suggesting his willingness to communicate with the Hellenistic realm.

Central Asian Contacts and their Results

Central Asian Contacts

The period around 200 BCE did not witness an empire as large as Mauryas but is regarded as an important period in terms of the intimate and widespread contacts between Central Asia and India. In Eastern India, Central India and the Deccan, the Mauryas were succeeded by a number of native rulers such as the Sungas, the Kanvas and the Satavahanas. In north-western India, the Mauryas were succeeded by a number of ruling dynasties from Central Asia.

Get a comprehensive note on the Mauryas for the IAS exam in the linked article.

Indo-Greeks/Bactrian Greeks

A series of invasions took place from about 200 BCE. The first to cross the Hindukush were the Greeks, who ruled Bactria, lying south of the Oxus river in the area covered by north Afghanistan. One of the important causes of invasion was the weakness of the Seleucid empire, which had been established in Bactria and the adjoining areas of Iran called Parthia. Due to the growing pressure from the Scythian tribes, the later Greek rulers were unable to hold their power in this area. The construction of the Chinese wall prevented the Scythians from entering China. So, their attention turned towards Greeks and Parthians. Pushed by the Scythian tribes, the Bactrian Greeks were forced to invade India. The successors of Ashoka were too weak to thwart the attack.

- In the beginning of the 2nd century BCE, the Indo-Greeks/Bactrian Greeks were the first to invade India.
- The Indo-Greeks occupied a large part of north-western India, much larger than that conquered by Alexander.
- It is believed that they pushed forward to as far as Ayodhya and Pataliputra.
- However, the Greeks failed to establish a united rule in India. Two Greek dynasties ruled north-western India on parallel lines at the same time.
- The Indo-Bactrian rule is important in the history of India because of the large number of coins issued by the Greek kings.
- The Indo-Greeks were the first rulers in India to issue coins which can be definitely attributed to the kings.

- It is rather interesting to note that out of the forty-two Indo-Greek kings, as many as 34 are known only through their coins.

Demetrius (King of Bactria)

- Invaded India around 190 BCE and probably also came into conflict with Pushyamitra Sunga, founder of the Sunga dynasty.
- Conquered a large part of north-western India and also extended Bactrian rule to the south of the Hindukush.

Menander/Milinda/Minedra (165 BCE- 145 BCE)

- The most celebrated Indo-Greek ruler who stabilized Indo-Greek power and also extended his empire's frontiers in India.
- Also included southern Afghanistan and Gandhara, the region west of the Indus river.
- Had his capital at Sakala (modern Sialkot, Punjab, Pakistan).
- It is believed that he invaded Ganga-Yamuna doab but had failed to retain it for long.
- He was converted to Buddhism by Nagasena, (also known as Nagarjuna). Menander has been identified with the king Milinda mentioned in the famous Buddhist text Milindapanho (Question of Milinda), which contains philosophical questions that Milinda asked Nagasena. The text claims that impressed by the answers, the king accepted Buddhism as his religion.
- He is also identified with king Minedra mentioned in a fragmented Kharosthi inscription found on a casket at Bajaur (presently in Pakistan) which refers to the enshrining of relics of the Buddha, probably in a stupa, during his reign.

Hermaeus

- He was the last ruler of this dynasty and was defeated by the Parthians around the last quarter of the 2nd century BCE, which led to the end of Greek rule in Bactria and the area to the south of the Hindukush.
- However, the Indo-Greek rule continued in north-western India for some more time.
- This north-western Gandhara region was also lost to Parthians and Shakas in due course of time.
- Later, in the late 1st century BCE or the early 1st century CE, the remaining part of the territory, i.e, the area to the east of the Jhelum also ceded to the Kshatrapa ruler Rajuvula.

Impact of the Indo-Greek Rule

- The Indo-Greeks were the first rulers in India to issue coins (gold, silver, copper and nickel). The coins of the Shakas, Parthians and the Kshatrapas followed the basic features of the Indo-Greek coinage, including the bilingual and bi-script legends. These coins provide important information about the religious sects and cults of that era (especially Shaiva and Bhagavata sects).

- The Indo-Greeks introduced Gandhara art in the north-west frontier of India, which was the outcome of the intermingling and influence of both Indian and central Asian contacts.
- The Indo-Greeks also introduced the practice of military governorship and the Governors were called strategos/satraps.
- The Hellenistic Greeks are well known for their monumental buildings and finely crafted objects. Excavation of the cities reveals a great talent in urban planning.

Shakas/Scythians

Shakas is the Indian term for the people called the Scythians, who originally belonged to Central Asia. The Greeks were followed by the Shakas, who controlled a much larger part of India than the Greeks. There were five branches of the Shakas with their seats of power in different parts of India and Afghanistan.

- One branch of the Shakas settled in Afghanistan. Prominent rulers of this branch were Vonones and Spalirises.
- The second branch settled in Punjab with Taxila as their capital. Maues was a prominent ruler.
- The third branch settled in Mathura, where they ruled for about two centuries. Azilises was a prominent ruler.
- The fourth branch established its hold over western India, where they continued to rule till the 4th century CE.
 - They ruled for the maximum period owing to a flourishing economy based on the sea-borne trade in Gujarat and also issued a large number of silver coins.
 - One of the famous Shaka rulers was Rudradaman 1 (CE 130-150).
 - He ruled over Sindh, Kutch and Gujarat and also recovered from the Satavahanas, Kokan, the Narmada valley, Malwa and Kathiawar.
 - He is famous in history because of the repairs he undertook to improve the Sudarsana lake in the semi-arid zone of Kathiawar.
 - He was a great lover of Sanskrit and issued the first-ever long inscription in chaste Sanskrit.
 - All the earlier longer inscriptions were composed in Prakrit.

The fifth branch of the Shakas established its power in the upper Deccan.

The Shakas did not meet effective resistance from the rulers and the masses of India. The king of Ujjain (around 58 BCE), effectively fought and succeeded in throwing the Shakas out. He called himself **Vikramaditya** and an era called Vikram-Samvat is reckoned from the event of his victory over the Shakas in 58 BCE. From this time onwards, Vikramaditya became a coveted title and whoever achieved anything great adopted this title, as the Roman emperors adopted the title Caesar in order to emphasize their great power.

Parthians

In the mid 1st century CE, the Shakas' domination in northwest India was followed by that of the Parthians.

- In many ancient Sanskrit texts, they are mentioned together as the Shaka-Pahlava.
- In fact, they ruled on parallel lines for some time.
- Originally the Parthians lived in Iran, from where they moved to India and in comparison with the Greeks and the Shakas they occupied a small portion of north-western India in the 1st century.
- The most famous Parthian king was Gondophernes (mentioned in an inscription dated 45 CE found at Takht-i-Bahi, recovered from Mardan near Peshawar) in whose reign Saint Thomas came to India to propagate Christianity.
- In due course of time, the Parthians, like the Shakas, became assimilated into Indian society and became an integral part of it. The Kushanas ultimately ousted the successors of Gondophernes from north-west India.

Kushanas

The Parthians were followed by the Kushanas who were also called Yue-Chis (moon tribe) or Tocharians. The Kushanas were one of the five clans into which the Yue-Chis tribe was divided. They were nomadic tribal people who were originally from the steppes of North Central Asia, in the neighbourhood of China. They first occupied Bactria or north Afghanistan where they displaced the Shakas, and gradually moved to the Kabul valley and seized Gandhara by crossing the Hindu Kush, replacing the rule of the Greeks and the Parthians in these areas. Finally, they set up their authority over the lower Indus basin and the greater part of the Gangetic basin. Their empire extended from the Oxus to the Ganga, from Khorasan in Central Asia to Varanasi in Uttar Pradesh. A good part of Central Asia, a portion of Iran, a portion of Afghanistan, the whole of Pakistan and almost the whole of northern India were brought under one rule by the Kushanas.

The Kushana dynasty was founded by a house of chiefs called Kadphises.

Kujula Kadphises 1 (15 CE – 64 CE)

- He laid the foundation of a unified Kushana empire by amalgamating the five clans of the Yue-Chi tribe.
- He minted the coins in copper and is believed to have imitated the Roman 'aurei' type coins to facilitate trade.
- His coins have been found south of the Hindukush.
- His coins give an idea about his association with Buddhism.
- He adopted the epithet 'Dharmathida' and 'Sachadharmathida'.

Vima Kadphises 2 (64 CE – 78 CE)

- He was the son of Kadphises 1.

- He conquered Gandhara from the Parthians and extended the kingdom to the east of the Indus till Mathura region.
- He issued a large number of gold coins.
- He was a firm devotee of Lord Shiva and proclaimed himself as ‘Mahishvara’ on his coins.

Kanishka (78 CE – 105 CE)

- The most famous Kushan ruler was Kanishka.
- During his reign, the kingdom expanded from Central Asia to Afghanistan and from northwestern India to further east into the Ganga valley and also southwards into the Malwa region. The empire also included Varanasi, Kaushambi and Shravasti in Uttar Pradesh and Sanchi in Madhya Pradesh. The centre of this huge empire was Bactria, as is evident in the use of the Bactrian language in Kanishka’s coins and inscriptions.
- The valuable information about Kanishka is provided by the famous Rabatak inscription (Afghanistan).
- Adopted the title of ‘Devputra’ and on some coins has been shown wearing a peaked helmet.
- His empire had two capitals – the first one was at Purushapura (Peshawar) where Kanishka erected a monastery and a huge stupa to house the Buddha’s relics. The second one was at Mathura in India.
- Kanishka is famous for two reasons:
 1. First, he started an era in 78 CE which is now known as the Shaka era and is used by the government of India for its calendar.
 2. Secondly, Kanishka extended his whole-hearted patronage to Buddhism. He also convened the **fourth Buddhist council** to discuss matters relating to Buddhist theology and doctrine. It was held at Kundalavana monastery near Srinagar (Kashmir) under the presidency of Vasumitra. **It was in this council that Buddhism was split into two schools – the Hinayana and the Mahayana.**
- Kanishka patronized Buddhist scholars of that era like Vasumitra (authored Mahavibhasa), Ashvagosha (wrote the hagiographic Buddhacharita), Charaka (The father of Ayurveda), Nagarjuna (a great advocate of the Mahayana doctrine and propounded the Madhyamaka which focuses on emptiness or Sunyata).
- Kanishka embraced Buddhism in the early part of his reign. However, his coins exhibit the images of not only Buddha but also of Greek and Hindu Gods. It reflects Kanishka’s tolerance towards other religions.
- Kanishka also patronised the Gandhara and the Mathura schools of sculpture. At Mathura, a headless statue of Kanishka depicting him as a warrior has been found.

Vasudeva (the last Kushana emperor)

- The successors of Kanishka were Vasishka, Huvishka, Kanishka II (who adopted the title of ‘Kaiser’) and Vasudeva – the last important Kushana ruler. The Kushana empire

was very much reduced in his rule. Around the mid 2nd century he took the title ‘Shaono Shao Vasudevo Koshano’, which reflects that by this time the Kushanas were totally Indianised.

Kushana power gradually declined from the early third century CE. The Kushana empire in Afghanistan and in the area west of the Indus was supplanted by the Sassanian power (of Iran) in the mid-third century CE. But Kushan principalities continued to exist in India for about a century. Some remnants of the Kushanas lingered on in the Kabul valley, Kapisa, Bactria, Khorezm and Sogdian (identical with Bukhara and Samarkand) in the third-fourth century CE.

Impact of Central Asian Contacts

The Central Asian influence was felt in almost all spheres and aspects of social life. The Shaka-Kushana phase introduced new elements to trade and agriculture, art and literature, pottery, science and technology, etc.

Pottery and Architecture

- The typical pottery of this age (Shaka-Kushana) was red ware, both in plain and polished form with medium to fine fabric.
- The distinctive pots being sprinklers and spouted channels.
- The age was marked by the construction of brick walls. The use of burnt bricks for flooring and tiles for both roofing and flooring was evident.

Trade and Agriculture

- The Shaka-Kushana phase saw the establishment of direct contact between India and Central Asia which helped to develop trade between the two.
- India imported a good deal of gold from the Altai mountains of Central Asia. Gold also may have been received in India through trade with the Roman empire.
- The silk route which started from China and crossed through the empire in Central Asia and Afghanistan to Iran and Western Asia was controlled by the Kushanas.
- This route was a source of great income to the Kushanas and they built a large prosperous empire because of the tolls levied from the traders.
- Although the Indo-Greeks introduced gold coins in India, the Kushans were the first rulers in India to issue gold coins on a large scale.
- The Kushans also promoted agriculture. The archaeological traces of irrigation facilities have been discovered in parts of Afghanistan, Pakistan and Western Central Asia.

Military equipment

- The Shakas and the Kushanas introduced better cavalry and popularised the use of riding horses on a large scale.
- The use of reins, saddles and toe-stirrup made of rope was common in this phase.
- They also introduced tunic, turban, trousers, heavy long coats and long boots which facilitated victories in war.

Polity

- The Shakas-Kushanas propagated the idea of the divine origin of kinship.
- The Kushan kings were called sons of god.
- The Kushanas introduced the “satrap system” of government wherein the empire was divided into numerous satrapies and each satrapy was placed under the rule of a Satrap.
- The Indo-Greeks introduced the practice of military governorship wherein they appointed their governors called strategos. Military governors were necessary to maintain the power of foreign rulers over the conquered people.

Indian Society

- The Shakas and the Kushanas added new elements to Indian culture and enriched it immensely.
- They settled in India for good and completely identified themselves with its culture.
- Since they did not have their own script, language or religion, they adopted these elements of culture from India.
- They became completely Indianised in course of time.
- As most of them came as conquerors they were absorbed in Indian society as a warrior class, Kshatriyas.
- The lawgiver Manu stated that the Shakas and the Parthians were the Kshatriyas who had fallen from their status and were thus considered as second-class Kshatriyas.
- In no other period of ancient history were foreigners assimilated into Indian society on such a large scale as they were in the post-Maurya period.

Religion

- Some of the foreign rulers converted to Vaishnavism (worshipped Vishnu – the god of protection and preservation).
- The Greek ambassador Heliodorus set up a pillar in honour of Vishnu near Vidisha in Madhya Pradesh.
- A few others adopted Buddhism, as in the case of the Greek ruler Menander who became a Buddhist.
- The Kushana rulers worshipped both Shiva and the Buddha as is evident from the images of these two gods on the Kushana coins.
- **The origin of Mahayana Buddhism:** The Central Asian contacts also influenced the Indian religions especially Buddhism.
 - Buddhism in its original form was too puritanical and abstract for foreigners.
 - They did not appreciate the philosophical doctrines of Buddhism, emphasized by the existing Buddhist schools.
 - So, there developed a new form of Buddhism called the Mahayana or the Great Wheel, in which the image of the Buddha began to be worshipped.

- This sect opened its doors for all sections of people.
- Those who did not follow this sect (newly found) came to be known as the followers of the Hinayana sect or the Small Wheel.
- Kanishka was a great patron of the Mahayana form of Buddhism who not only organised the fourth Buddhist council at Srinagar but also set up many stupas to perpetuate the memory of the Buddha.

Art and Literature

The construction of stupas and development of regional schools of sculpture are the two main features concerning art and architecture of this period.

Stupas – A stupa is a large hemispherical dome having a central chamber in which relics of the Buddha or some Buddhist monk are kept in a small casket. The base is surrounded by a path for clockwise circumambulation (pradakshina), enclosed by wooden railings which were later made in stone. The three main stupas of this period are at Bharhut (dates to the middle of the second century, its railings are made of red stone), Sanchi (three big stupas were constructed at Sanchi, the biggest one was originally made by Ashoka, which was enlarged to twice its size in the second century), and Amravati and Nagarjunkonda (Andhra Pradesh).

Schools of Sculpture – The Central Asian rulers became enthusiastic patrons of Indian art and culture and showed great zeal in establishing new schools of art. The Kushana empire brought together masons and other artisans trained in different schools and countries. Indian craftsmen came into contact with the Greeks and the Romans, especially in the north-western frontier of India in Gandhara. The three main schools of sculptural art which developed in this period were – Gandhara school of Art, Mathura school of Art and Amravati school of Art.

Hinduism

The first known bilingual coins of the Indo-Greeks were issued by Agathocles around 180 BCE. These coins were found in Ai-Khanoum, the great Greco-Bactrian city in northeastern Afghanistan, but introduce for the first time an Indian script (the Brahmi script which had been in use under the Mauryan empire), and the first known representations of Hindu deities, in a very Indian iconography: Krishna- Vasudeva, with his large wheel with six spokes (chakra) and conch (shanka), and his brother Sankarshan- Balarama, with his plough (hala) and pestle (masala), both early avatars of Vishnu. The square coins, instead of the usual Greek round coins, also followed the Indian standard for coinage. The dancing girls on some of the coins of Agathocles and Pantaleon are also sometimes considered as representations of Subhadra, Krishna's sister.

These first issues were in several respects a short-lived experiment. Hindu anthropomorphic deities were never again represented in Indo-Greek coinage (although the bull on the vast quantity of subsequent coins may have symbolized Shiva, as the elephant may have symbolized Buddhism), and the Brahmi script was immediately replaced by the Kharoshthi script, derived from Aramaic. The general practice however of minting bilingual coins and combining Greek and Indian iconography, sometimes in the Greek and sometimes in the Indian standard continued for the next two centuries.

In any case, these coins suggest the strong presence of Indian religious traditions in the northwestern Indian subcontinent at that time, and the willingness of the Greeks to acknowledge and even promote them. Artistically, they tend to indicate that the Greeks were not particularly reluctant to make representations of local deities, which has some bearing on the later emergence of the image of the Buddha in Hellenistic style.

The Heliodorus pillar inscription is another epigraphical evidence of the interaction between Greeks and Hinduism. The pillar was erected around 110 BCE in central India at the site of Vidisha, by Heliodorus, a Greek ambassador of the Indo-Greek king Antialcidas to the court of the Sunga king Bhagabhadra. The pillar was surmounted by a sculpture of Garuda and was apparently dedicated by Heliodorus to the temple of Vasudeva.

"This Garuda-standard of Vasudeva (Vishnu), the God of Gods
 was erected here by the Bhagavata Heliodorus,
 the son of Dion, a man of Taxila,
 sent by the Great Greek (Yona) King
 Antialkidas, as ambassador to
 King Kasiputra Bhagabhadra, the Savior
 son of the princess from Benares, in the fourteenth year of his reign."
 (Heliodorus pillar inscription)

| Gandhara School of Art | Mathura School of Art | Amravati School of Art |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| It is also known as the Graeco-Buddhist school of art. It was based on Graeco Roman norms wherein the theme of sculptures is predominantly Buddhist but their style is Greek. | It was a purely indigenous school of art. It evolved from the representation of Yakshas (male deities). The presentation of female beauty as a vehicle of art was a novel experiment of the Mathura school. | This school of art was also indigenous in nature. |
| Found primarily in north-west India. | Found primarily in Mathura, Sonkh and Kankalitila (part of north India). | Found in Andhra Pradesh between the valleys of the rivers Krishna and Godavari. |
| It is believed to have flourished between 100 CE and 700 CE. | It is said to have flourished between 100 BCE and 600 CE. | It is believed to have flourished between 150 BCE and 350 CE. |

| | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The Kushanas were the main patrons of this form of art.</p> | <p>The Kushanas were the main patrons of this form of art.</p> | <p>The Satavahanas were the main patrons and were later propagated by their successors - Ikshvaku rulers.</p> |
| <p>Mainly Buddhist images are found. There is a great influence of Buddhism and Hellenistic realism. The famous Bamyan Buddha of Afghanistan belongs to this school of art.</p> | <p>It is influenced by all the three religions – Buddhism, Jainism and Brahmanism. It consists of the stone images of Buddha, Mahavira and also of Brahmanical deities. The sculptures of Brahmanical deities like Kartikeya, Vishnu, Kubera along with the headless erect statue of Kanishka were carved during the Kushana period. The Mathura school of art also produced sculptures of Jaina deities besides the ayagapatas or stone slabs to place objects of worship and Sarvatobhadrika image of four Jain Jinas. The sculptures of yakshas and yakshis, naga and naganis, and other sensual females are also part of this school of art.</p> | <p>The thematic representations include the stories from the life of the Buddha, mostly from Jatakas.</p> |
| <p>Chief characteristic features of <u>Gandhara school of art</u> –</p> <ul style="list-style-type: none"> • Sculpture is shown in spiritual state. • Realistic images. • Less ornaments. • Lean body. • Expressive images. • Great detailing and rich carving. | <p>Chief characteristic features of Mathura school of art-</p> <ul style="list-style-type: none"> • Sculpture in delighted mood. • Images are lacking in spiritual look. • Having strong muscular structure and energetic. • Attention is not paid to detailing. • Less expressive images. | <p>The chief characteristic feature of the Amravati school is narrative art, depicting an incident in a natural way. For instance, one medallion depicts a whole story of ‘taming of an elephant by the Buddha’. There is a prominence of</p> |

| | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| | | human figures in comparison to figures drawn from nature. |
| <p>Features of Buddha sculpture –</p> <ul style="list-style-type: none"> • Spiritual Buddha. • Sad Buddha. • Bearded Buddha. • Buddha in yogi postures. • Buddha is depicted with a garment draped in Graeco-Roman style, with wavy hairs, large forehead and long ears. • Halo not decorated. <p>Different Mudras portrayed-</p> <ul style="list-style-type: none"> • Abhaya Mudra (don't fear). • Bhumisparsha Mudra (touching the earth). • Dhyana Mudra (meditation). • Dharmachakra Mudra (preaching pose). | <p>Features of Buddha sculpture –</p> <ul style="list-style-type: none"> • Delighted Buddha. • Lacking spiritual look. • With no beard or moustache. • Shaven head and face. • Seated in Padmasana. • Graceful posture of Buddha. • The halo around the Buddha was heavily decorated with geometrical motifs. • Buddha is surrounded by two monk s- Padmapani (holding lotus) and Vajrapani (holding vajra). • The standing Buddha of Sravasti and Kaushambi. | <p>Sculptures of this school are mainly found on the railings, plinths and other parts of stupas.</p> |
| Predominantly, blue-grey stone used for making idols of Buddha and Bodhisattva. | Local red stone with black spots used to make the images. | Used white marble-like stone to carve out the figures. |

Instances of Hellenistic influence

During that period, several instances of artistic influence are known, particularly in the area of monumental stone sculpture and statuary, an area with no known precedents in India. The main period of stone architectural creation seems to correspond to the period of Ashoka's reign.

(c.?268–232 BCE). Before that, Indians may have had a tradition of wooden architecture, but no remains have ever been found to prove that point. However remains of wooden palisades were discovered at archaeological sites in Pataliputra, confirmed Classical accounts that the city had such wooden ramparts. The first examples of stone architecture were also found in the palace compound of Pataliputra, with the distinctly Hellenistic Pataliputra capital and a pillared hall using polished-stone columns. The other remarkable example of monumental stone architecture is that of the Pillars of Ashoka, themselves displaying Hellenistic influence. Overall, according to Boardman, "the visual experience of many Ashokan and later city dwellers in India was considerably conditioned by foreign arts, translated to an Indian environment, just as the archaic Greek had been by the Syrian, the Roman by the Greek, and the Persian by the art of their whole empire".

Pataliputra capital (3rd century BCE)



Front of the Pataliputra capital, found in Pataliputra and dated to the 3rd century BCE

The Pataliputra capital is a monumental rectangular capital with volutes and Classical designs, that was discovered in the palace ruins of the ancient Mauryan Empire capital city of Pataliputra (modern Patna, northeastern India). It is dated to the 3rd century BCE. It is, together with the Pillars of Ashoka, one of the first known examples of Indian stone architecture, as no Indian stone monuments or sculptures are known from before that period. It is also one of the first archaeological clues suggesting Hellenistic influence on the arts of India, in this case sculptural palatial art. The Archaeological Survey of India, an Indian government agency attached to the Ministry of culture that is responsible for archaeological research and the conservation and preservation of cultural monument in India, straightforwardly describes it as "a colossal capital in the Hellenistic style".

Although this capital was a major piece of architecture in the Mauryan palace of Pataliputra, since most of Pataliputra was not excavated, and remains hidden under the modern city of Patna, it is impossible to know the exact nature or extent of the monuments or the buildings that incorporated it.

One capital from Sarnath is known, which seems to be an adaptation of the design of the Pataliputra capital. This other capital is also said to be from the Mauryan period. It is, together with the Pataliputra capital, considered as "stone brackets or capitals suggestive of the Ionic

order". A later capital found in Mathura dating to the 2nd or 3rd century (Kushan period) displays a central palmette with side volutes in a style described as "Ionic", in the same kind of composition as the Pataliputra capital but with a coarser rendering. (photograph)

Pillars of Ashoka (3rd century BCE)



Greek votive columns such as the Sphinx of Naxos, Delphi, 560 BCE (left), may have influenced the creation of the Pillars of Ashoka, 250 BCE (here at Lauria Nandangarh). // The horse motif on the Sarnath Lion Capital of Ashoka is often described as an example of Hellenistic realism

The Pillars of Ashoka were built during the reign of the Maurya Empire Ashoka c. 250 BCE. They were new attempts at mastering stone architecture, as no Indian stone monuments or sculptures are known from before that period.

There are altogether seven remaining capitals, five with lions, one with an elephant and one with a zebu bull. One of them, the four lions of Sarnath, has become the State Emblem of India. The animal capitals are composed of a lotiform base, with an abacus decorated with floral, symbolic or animal designs, topped by the realistic depiction of an animal, thought to each represent a traditional direction in India. Various foreign influences have been described in the design of these capitals.

Greek columns of the 6th century BCE such as the Sphinx of Naxos, a 12.5m Ionic column crowned by a sitting animal in the religious center of Delphi, may have been an inspiration for the pillars of Ashoka. Many similar columns crowned by sphinxes were discovered in ancient Greece, as in Sparta, Athens or Spata, and some were used as funerary steles. The Greek sphinx, a lion with the face of a human female, was considered as having ferocious strength, and was thought of as a guardian, often flanking the entrances to temples or royal tombs. Placing animals on top of a lotiform capital also reminds of Achaemenid columns.

The animals, especially the horse on the Sarnath Lion Capital of Ashoka or the bull of the Rampurva capital are said to be typically Greek in realism, and belong to a type of highly realistic treatment which cannot be found in Persia.

The abacus parts also often seem to display a strong influence of Greek art: in the case of the Rampurva bull or the Sankassa elephant, it is composed of flame palmettes alternated with stylized lotuses and small rosettes flowers. A similar kind of design can be seen in the frieze of the lost capital of the Allahabad pillar. These designs likely originated in Greek and Near-Eastern arts. They would probably have come from the neighboring Seleucid Empire, and specifically from a Hellenistic city such as Ai-Khanoum, located at the doorstep of India.

Temple architecture (3rd century BCE)

Some of the earliest free-standing temples in India are thought to have been of a circular type, as the Bairat Temple in Bairat, Rajasthan, formed of a central stupa surrounded by a circular colonnade and an enclosing wall, built during the time of Ashoka and near which were found several Minor Rock Edicts. Ashoka also built the Mahabodhi Temple in Bodh Gaya c. 250 BCE, also a circular structure, in order to protect the Bodhi tree. Representations of this early temple structure are found on a 100 BCE relief from the stupa railing at Bhārhut, as well as in Sanchi. These circular-type temples were also found in later rock-hewn caves such as Tulja Caves or Guntupalli.

It has been suggested that these circular structures with colonnades may have originated with the Greek circular Tholos temple, as in the Tholos of Delphi, but circular wooden huts in India could also have been an inspiration.

Diamond throne of Bodh Gaya (3rd century BCE)

The **Vajrasana** *diamond throne* or **Enlightenment Throne of the Buddha**, is an ancient stone slab located under the Bodhi tree, directly beside the Mahabodhi Temple at Bodh Gaya. The slab is thought to have been placed at Bodhgayā by emperor Ashoka of the Maurya Empire between 250-233 BCE, at the spot where the Buddha meditated. The vajrasana is bodhimanda of Gautama Buddha. Being the site where Gautama Buddha achieved liberation, Tibetan texts also use the term vajrasana to refer to Bodh Gaya itself. The empty throne was a focus of devotion in early Buddhism, treated as a cetiya or symbolic relic. It was not intended to be occupied, but operated as a symbol of the missing Buddha. Ancient images show devotees kneeling in prayer before it, as they still do.

The Diamond throne, or *Vajrasana*, is a throne in the Mahabodhi Temple at Bodh Gaya, built by king Ashoka c. 260 BCE, in order to mark the place where the Buddha reached enlightenment. Ashoka is thought to have visited Bodh Gaya around 260 BCE, about 10 years into his reign, as explained by his Rock Edict number VIII.



The Butkara stupa was reinforced and decorated from the Indo-Greek period on/ Discovery of Ashoka's Diamond throne in Bodh Gaya in 1892, near the spot of the Buddha's illumination and the Bodhi tree.

The Indo-Greek period (180 BCE – 20 CE) marks a time when Bactrian Greeks established themselves directly in the northwestern parts of the Indian subcontinent following the fall of the Maurya Empire and its takeover by the Sunga.

Religious buildings

Indo-Greek territories seem to have been highly involved with Buddhism. Numerous stupas, which had been set up during the time of Ashoka, were then reinforced and embellished during the Indo-Greek period, using elements of Hellenistic sculpture. A detailed archaeological analysis was made especially at the Butkara stupa which allowed to define precisely what had been made during the Indo-Greek period, and what came later. The Indo-Greeks are known for the additions and niches, stairs and balustrades in Hellenistic architectural style. These efforts would then continue during the Indo-Scythian and Kushan periods.

Greeks in Indian stone reliefs

Numerous depictions of Greeks are known from the area of Gandhara. The Buner reliefs in particular have some of the clearest depictions of revelers and devotees in Greek attire.

Buddhist monuments in the heartland of India also have such depictions. Some of the friezes of Sanchi show devotees in Greek attire. The men are depicted with short curly hair, often held together with a headband of the type commonly seen on Greek coins. The clothing too is Greek, complete with tunics, capes and sandals, typical of the Greek travelling costume. The musical instruments are also quite characteristic, such as the double flute called aulos. Also visible are carnyx-like horns. They are all celebrating at the entrance of the stupa. These men would be foreigners from north-west India visiting the Stupa, possibly Mallas, Sakas or Indo-Greeks.^[57]

Three inscriptions are known from Yavana donors at Sanchi, the clearest of which reads "*Setapathiya Yonasa danam*" ("Gift of the Yona of Setapatha"), Setapatha being an uncertain city.

Indo-Greek coinage is rich and varied, and contains some of the best coins of antiquity. Its influence on Indian coinage was far-reaching. The Greek script became used extensively on coins for many centuries, as was the habit of depicting a ruler on the obverse, often in profile, and deities on the reverse. The Western Satrap, a western dynasty of foreign origin adopted Indo-

Greek designs. The Kushans (1st–4th centuries CE) used the Greek script and Greek deities on their coinage. Even as late as the Gupta Empire (4th-6th centuries CE), Kumaragupta I issued coins with an imitation of Greek script.

Greco-Buddhist art 1 st to 4 th Century BCE

A tetrastyle prostyle early Gupta period temple of almost Classical appearance at Sanchi, an example of Buddhist architecture.

The full bloom of Greco-Buddhist art seems to have postdated the Indo-Greek Kingdom, although it has been suggested that individual Greek artisans and artist probably continued to work for the new masters. It is apparently during the rule of the Indo-Scythian, the Indo-Parthian and Kushan that Greco-Buddhist art evolved to become a dominant art form in the northwest of the Indian Subcontinent. Whereas other areas of India, especially the area of Mathura received the influence of the Greco-Buddhist school remains a matter of debate.

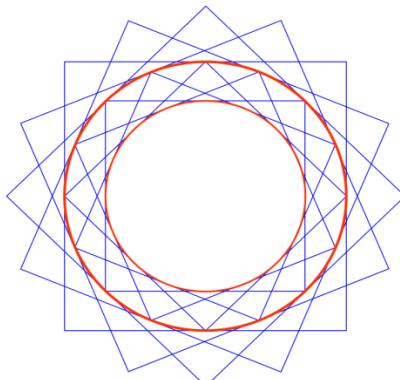
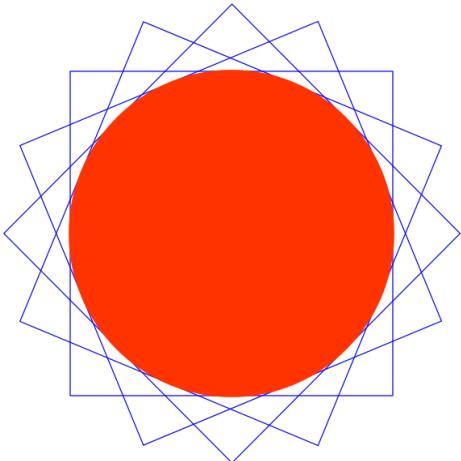
Many Indian scholars have argued that the notion of Greco-Buddhism, originated by European scholars, goes too far towards relocating Gandharan art as close to Greek and sometimes Persian art and defining ancient Indian art in terms of classical Greco Roman art itself. The archaeologist John Marshall on his visit to Taxila and Gandhara was reported as stating, 'it seemed as I had lighted on a bit of Greece itself' and I felt then there was something appealingly Greek in the countryside itself'. Pierre Dupont thought of his trip to Pakistan in 1954 as 'a pious trip to the Greco-Buddhist country'. G. W. Leitner coined the term 'Greco-Buddhist' for pieces of Gandharan art which had reached Europe in 1870 and hailed them as a new page in the history of 'Greek art' instead of 'Indian art'.

The ancient temple complex discovered in Nagari (Chittorgarh, Rajasthan) – about 500 kilometers to the west of Vidisha, has a sub-surface structure nearly identical to that of the Besnagar temple. The structure is also associated to the cult of Vāsudeva and Saṃkarṣaṇa, and dated to the 1st century BCE.

There was a need felt to further define the temple as a shelter for both the deity and the worshiper that resulted in the architects beginning 'to extend the measure of the sanctum's sacred central spaces in ways that could be made visible on the temple's outer wall. To this end, they first applied a broad central buttress to each wall on which a sculptured image representing one aspect of the inner deity could be placed.

The Design Principles of 4

The design principle of Hindu temples extensively uses circles and squares - both in their horizontal layout and vertical spire design. This is almost universal in ancient Hindu temples found in India, as well outside South Asia. Designs that use harmonic ratios other than perfect square and circle are known, but these too are precise mathematical series and ratios embedding squares and circles inside rectangles (1:2, 1:3, 2:3, 2:5, etc).



Concentric circles and squares
in a Hindu temple Spire

Circle and squares in Hindu temple Spires Vastu Purusa Mandala

For spires rising towards the sky, above the Brahma padas of Hindu temples, turning-square and circumscribing circle geometry is very common in Hindu temples or Mandirs. This is both a structural design derivation as well as representative of philosophical beliefs of Hindus. These are described in ancient Sanskrit texts called Vastu sastras (science of dwelling) - the source of above drawing.

At the center of these squares and circles, underneath the spire is the main deity of the temple (visible) as well as the Purusa (Universal Principle with no form, only knowledge and meaning, reflecting Truth and Reality for Hindus).

The relationship between the 'square' and the 'circle' in a sequence which, with the help of the stellate square form with its intersecting points, the marmas, resonates throughout the temple's space and form in conjunction with its subsidiary shrines.

Dr. Ananya Ganotra in his book *Indian Temple Architecture - Analysis of Plans, Elevations and Roof Forms (in 3 Vols)* unravels with effective use of computer technology the uniformity, great proportions and geometry that the Hindu Temple Architecture is based upon. He also challenges and readdresses the predominant theories of temple architecture like the Vastu Purush Mandala and the Sri Yantra. It sets forth the theory that there is an evident micro level integration of dimensions and proportions which all originate from the idol, set in the womb of the structure: the Garbhagriha.

Unfolding the relationship between the 'square' and the 'circle' in a sequence which, with the help of the stellate square form with its intersecting points, the marmas, resonates throughout the temple's space and form in conjunction with its subsidiary shrines. It also establishes, a strong relationship between the prasada and the mandapa. This three volume book establishes the interdependency of the temple's elevation and its roof form to the plan and its dimensions, setting forth the need for the scholarship to address the temple structure as a whole. With the use of examples

from different time and space, the book establishes that the temples underlining design principles remain the same, smallest denominator being the unit dimension of the idol, Shiva lingam or the idol pedestal. Therefore, the later date typologies were of no relevance to the sthapatis of these manifestations. It also establishes a strong relationship between the prasada and the mandapa. The potent intersection of the two SCS sets the canvass for erotic iconography as evident in temples of Khajuraho. The temples underlining design principles remain the same, smallest denominator being the unit dimension of the idol, Shiva lingam or the idol pedestal. Therefore, the later date typologies were of no relevance to the sthapatis of these manifestations.

Prologue

The presence of a Square-Circle-Sequence (SCS) in the temple as a governing device was established for the plan in the previous chapter. It was found that it originates from the smallest circle (lingam/square of the image and the squares in the SCS sequence formed can be further developed into conjectural 16-pointed constructional stars (16 petaled lotuses). These, as part of the SCS system, can then be used for analysing and possibly governing, the measurement and proportions of plan. It was shown to be useful for identification of all the edges and corners, including that of the wall of the sanctum (antarabhitti) and the external facade of the temple (prasada). For the larger temple complexes like Brihadesvara, Tanjavur and Brahmeshwara, Bhubaneshwar the SCS was successful in relating the proportions of the main shrine to the subsidiary ones. To establish the principle Of design and planning for the temple elevation, smaller latina temples and a few shekhari types have been adopted for the analysis. But before that we will consider the basic principles of Rekha and the proportion of the temple elevation.

Mainly the curvatures of the main spire (mulamanjari) are shown but in the Shekhari types an occasional attempt is also made to study the curvatures of the urahshringas and the shringas as well. It will be shown how the inner dimensions as well as the proportions of the plan are directly translated on to the external elevation including the rekha of the temple structure. I quote from him:

“It will be shown that the curvature (rekha sutra) is derived from the Square-Circle-Sequence (SCS). The architects decision on which circle of the SCS is applied to define the curvature of the shikhara, would define its characteristic. The proportions of the deity /Linga are repeated and translated in the complete temple plan and elevation. In some of the examples there is a possibility that the centre of the circle used for the rekha curvature corresponds with the level of the first bhumi-amalaka. Another common phenomenon in most of the studied temples is that the shikhara profile starting from the base till the bottom of the first bhumi level is straight and then it curves in. The link between the SCS and the planning and design of an Indian temple can be further strengthened by observing that the area of the temple is sometimes equal to one of the square of the SCS .

1.1 Geometry and Proportions of the Temple Elevation

The most important derivation of the Square-Circle-Sequence with respect to the elevation is its direct application to the Rekha profile. The SCS geometry can also be applied to derive the proportions of both the vertical wall-divisions (anga- bhanga) like the bhadra, pratibhadra and kama and the horizontal divisions viz., the platform (jagati), the moulded plinth base (pitha), the

basal wall moulding above the pitha (the *vedi-bandha*), the wall frieze (*jangha*) and the spire (*sikhara*). Similarly, a relationships can also be established between the SCS proportions and the various diameters of the crowning parts of the Shikhara, the neck (*griva*), the myrobolan circular stone crownings (the *amalakha* and the *amalsarika*), and intermediate fluted melon-shaped mouldings (*chandrika*, *kalasa* and the *vijapuraka*) and the *griva*. The analysis of the *rekha* or curved profile can be applied to the study of Latina as well as the Shekhari form of temples which is the further development of the single spire form of the Latina temple structure.¹ The SCS as a common phenomenon has already been established in the Chapter on geometry.

1.2 Origins of the *Sikhara* form

The beginning of the curvilinear shikhara spire could be around late Kusana period which developed further through the Gupta period and reached a distinct though primitive form by the Sixth century. The curve reached its perfect form by the tenth century as can be seen in the Khajuraho temples. Although there are various hypothesizes about the possible origins of the Latina temple form and profile nothing can be said for definite.¹ Fergusson is satisfactorily convinced by the hypothesis that the form of the shikhara was a constructional necessity which he though expresses as not to be accounting for the conversion of the square in the plan to the curvilinear form in the elevation.¹ The theory assumes that a very tall well pointed arch fits the external form of the shikhara. He also hints at possible Persian origins to the use by the classically antiquated Hindus of the 'graceful curvilinear shape' than the straight line form as seen in Bodh-Gaya.

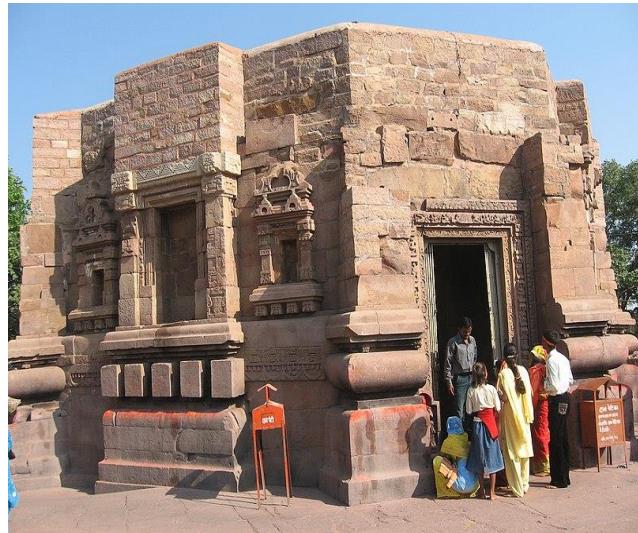
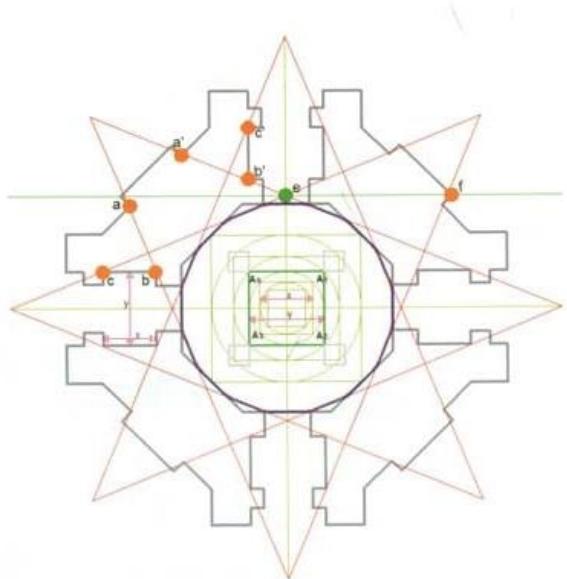
Taking Fergusson's theory forward that if we take a look at the construction and the possible origins of the techniques which even in the present time are very inspiring we can then trace its root to the other civilizations which had fully developed such techniques, at the time temple building activity was starting. Since the curvilinear Latina form is not the earliest form of the temple, there could be a possible origin from Egypt, not definitely for its meaning and interpretation of form but possibly for the know-how of structural and constructional principals. A possible study in the use of their techniques of measuring (including measuring distance, measuring inclinations, leveling, constructing the right angle and orientation) along with the possible ways of doing construction line and setting marks (including Setting lines, Leveling lines, Inclination lines, Setting marks for columns and pillars, Distance marks and also positioning marks) need to be studied and tested for the Hindu temples. Even though the question of the foreign origin can not be established we can make interesting observations like that the earlier Egyptian structures were brick which later developed to stone structure while still applying brick constructional principals like regular blocks set in a pattern of brick bonding and inwardly inclining rows and use of a lot of mortars . Only later there developed a proper system of stone masonry. Also the use of metallic dowels in joinery over the use of stone was practices in Egypt and also in India by the 10th Century.

The thing that surprises me immensely is the fact that all the research that has been conducted so far has been conducted single dimensionally. There has been a constant inability to connect the plan to its elevation and hence the mystery behind the evolving complexity has been left uncovered. Although the exactness in replication with finer changes to the iconography and the ornamentation of the 4 Fergusson, James, History of Indian and Eastern Architecture, 1876. Fergusson expresses a desire that one day we would know the method of reaching to this

perfection. The development of the form has been without 'hesitation' from the beginning of the 7th century to the following twelve/thirteen centuries which has only seen it more and more 'attenuated'. 5 Arnold, Dieter, Building in Egypt - Pharonic Stone Masonry, 1991, Oxford University Press. surface facade has made the complete spectrum of temple architecture gain certain uniqueness and originality but one has time and time again not looked for answers which are hidden in its very form, both in the plan as well as the elevation."

The **Mundeshwari Devi Temple** (also spelled *Mundesvari*) is a Hindu temple, located at ramgarh village, 608 feet (185 m) on the Mundeshwari Hills of Kaimur plateau near Son River, in the Indian state of Bihar. The temple, built of stone, is on an octagonal plan, which is rare. It is the earliest specimen of the Nagara style of temple architecture in Bihar. There are doors or windows on four sides and small niches for the reception of statues in the remaining four walls. The temple *shikhara* or tower has been destroyed. However, a roof has been built, as part of renovation work. The interior walls have niches and bold mouldings which are carved with vase and foliage designs. At the entrance to the temple, the door jambs are seen with carved images of Dvarapalas, Ganga, Yamuna and many other murtis. The main deities in the sanctum sanctorum of the temple are of the Devi Mundeshwari and *Chaturmukh* (four-faced) Shiva linga. It is an Archaeological Survey of India (ASI) protected monument since 1915. The ASI has recently dated the structure to 108 CE making it the oldest Hindu temple in the country. An information plaque at the site indicates the dating of the temple at least to 625 CE and Hindu inscriptions dated 635 CE were found in the temple.

It is an ancient temple dedicated to the worship of the goddess Durga and is considered one of the oldest functional Hindu temples in India. The findings also established that here was a religious and educational center spread over the hillock and Mandaleshwari (Shiva) temple was the main shrine. The Mandaleshwari (Durga) was on the southern side. The temple was damaged and the idol of Mandaleshwari (degenerated Mundeshwari and later connected with the mythical demon Mund) was kept in the eastern chamber of the main temple.



Octagonal Plan of the Mandaleshwari temple

Timelines

- **636 - 38 CE** - Chinese visitor Huen Tsang writes about a shrine on a hill top flashing light, at about a distance of 200 lee south west to Patna-The location is only of Mundeshwari.
- **1790 CE** - Daniel brothers, Thomas and William visited Mundeshwari temple and provided its first portrait.
- **1888 CE** – Buchanan visited the region in 1813.
- **1891-92 CE** – First part of the broken Mundeshwari Inscription was discovered by Bloch during a survey by East India Company.
- **1903 CE** – Second part of the inscription was discovered while clearing the debris around the temple.
- **2003 CE** – Brahmi script royal seal of Sri Lankan king Dutthagamani (101-77 BCE) was discovered by Varanasi-based historian Jahnawi Shakhar Roy which changed the earlier findings about history of the place.
- **2008 CE** - The date of the inscription was established 30th year of Saka era (108 CE) by the scholars in a national seminar organized for the purpose by Bihar State Religious Trust Board at Patna.

The worship of Devi Durga in the form of Devi Mundeshwari in the temple is also indicative of tantric cult of worship, which is practiced in Eastern India.

Rituals and worship have been performed here without a break, hence Mundeshwari is considered one of the most ancient Hindu temples in India. The temple is visited by a large number of pilgrims each year, particularly during the Ramnavami, Shivratri festivals. A big annual fair (*mela*) is held nearby during the Navaratra visited by thousands.

There are also two stone vessels of unusual design. Even though the Shiva linga is installed in the centre of the sanctum, the main presiding deity is Devi Mundeshwari deified inside a niche, which is seen with ten hands holding symbols riding a buffalo, attributed to Mahishasuramardini.

The temple also has murtis of other popular gods such as Ganesha, Surya and Vishnu. A substantial part of this stone structure has been damaged, and many stone fragments are seen strewn around the temple. However, under the jurisdiction of ASI, it has been the subject of archaeological study for quite some time.

Tanisha Dutta , V. S. Adane—*In Symbolism in Hindu Temple Architecture and Fractal Geometry - 'Thought Behind Form'*,(International Journal of Science and Research (IJSR) 3(12):489-497.December 2014 from the project: Interpreting Symbolism in Medieval Hindu Temple Architecture through Fractal Geometry.)

1. Geometry and its Application

In Hindu thought, number is considered an expression of the structure of the universe and a means of effecting the interplay between the universe and man (Michell, 1977, 1988). When numbers are given shape and form, geometry comes into play. To be able to impart the symbolic meanings to the mind of the observer through the eyes and brain, there was a need to establish a certain geometry which will attract the eyes and arouse the brain. To be able to convey these represents movement, and therefore time. The square and circle, by their very nature, are constant, but the rectangle is not. The square, with its potential to include competing elements, when enclosing a circle represents the dimensions of both space and time. As the cosmos is represented by the circle symbolically, the process of making an architectural model of the cosmos involves the representation of a circle in a square grid in two-dimensional construction and of an ellipsoid (the cosmic egg) in a cubical grid in three-dimensional construction. A process of descritization of all curved forms is necessitated by this need to represent them in a square grid, which results in the typical jaggedness of the temple plan (Trivedi, 1993). The transformation of circle to square and square to circle is not one which can be explained through Euclidian geometry. It needs an intricate understanding of the nature and geometry of natural forms. The process by which natural elements gain their unique form can be applied to the temple structures to find the underlying theme. The application of this algorithm to the temple construction gives it the remarkable appearance.

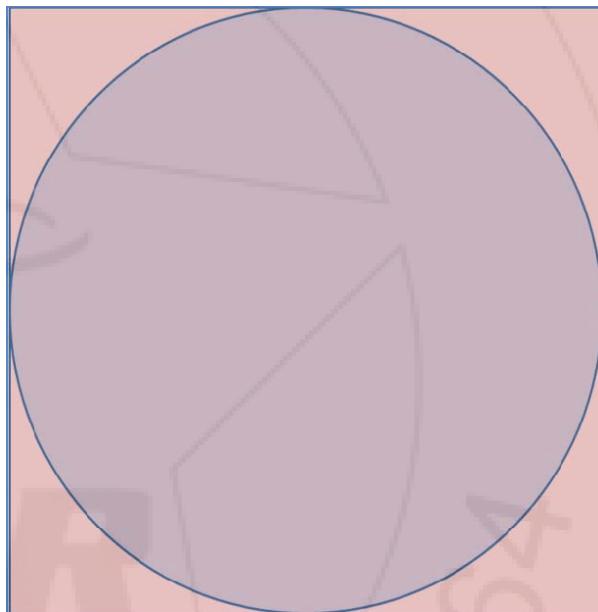


Figure 3: Square and Circle Superimposed; Symbolising the earth and the cyclical time meanings through form, a strong relationship had to be developed between form and meanings in a decipherable language. This relationship that develops between forms and their meanings within the Hindu temple is essential to its function as a link between the gods and man (Michell, 1977, 1988).

The basic plan form of any temple is built upon the *Vastu Purush Mandala*, which is a square, representing the earth. It also symbolises order, the completeness of endless life and the perfectness of life and death (Michell, 1977, 1988). In the foundation of any Hindu temple, cosmos is embodied by laying down the diagram of Vastu Purush Mandala on a selected ground. This divine diagram reflects the image of cosmos through its fractal qualities (Md Rian I, et. al., 2007). The Mandala can be considered an ideogram, while the temple is the material manifestation of the concepts it embodies (Trivedi, 1993).

The square symbolises order, unequivocal form, the celestial sphere and the absolute. The circle on the other hand

The superimposition of the square and the circle is significant considering their individual symbolic meanings (Figure 3: Square and Circle Superimposed; Symbolising the earth and the cyclical time). Both of these when put together acquire the properties of order and movement. Also, this superimposition depicts the celestial sphere and the Absolute, with respect to time; where eternal time is also the smallest moment. This proves the involvement of circle with square, with respect to the temple concept and philosophy. The most impressive aspect of the temple representation is that it occurs both at the level of the part as well as the whole in a recursive fashion mirroring the Vedic idea of the microcosm symbolising the macrocosm at various levels of expression (Kak, Space and Cosmology in the Hindu Temple , 2002)

Nevertheless, this form of geometry, i.e. Euclidian Geometry, does not suffice to generate the process of development of the structure of the temple. It does not help to describe the form of the Hindu Temple and its embodied depictions of dynamics, movement, tension, order and harmony. Fractal geometry, though, has been found to be able to explain most of the forms and patterns in a temple complex.

In conclusion they say that ,” There is the philosophical connotations of the various strategies and tactics employed in its construction, which meets not only the human eyes but the intellect.

They find that the primitive, but beautifully complex, and satisfying form of these temples has been arrived at; not through the use of complex computer algorithms, generative of structures; but by intuitive processes, giving a fair idea of human intrinsic affiliations, satisfying intellectual needs. It is estimated that, had fractal geometry not been used in the physical manifestation of the temple philosophy, it would have been difficult to impart the knowledge intended by temple construction. Every element in the temple structure, the prasada, the shikhara, the finial, the sculpture on the exterior and interior walls, the jagged plan form and the appearance in totality, take help of fractal geometry; within the perceivable scales; to

promote their idea and concept.

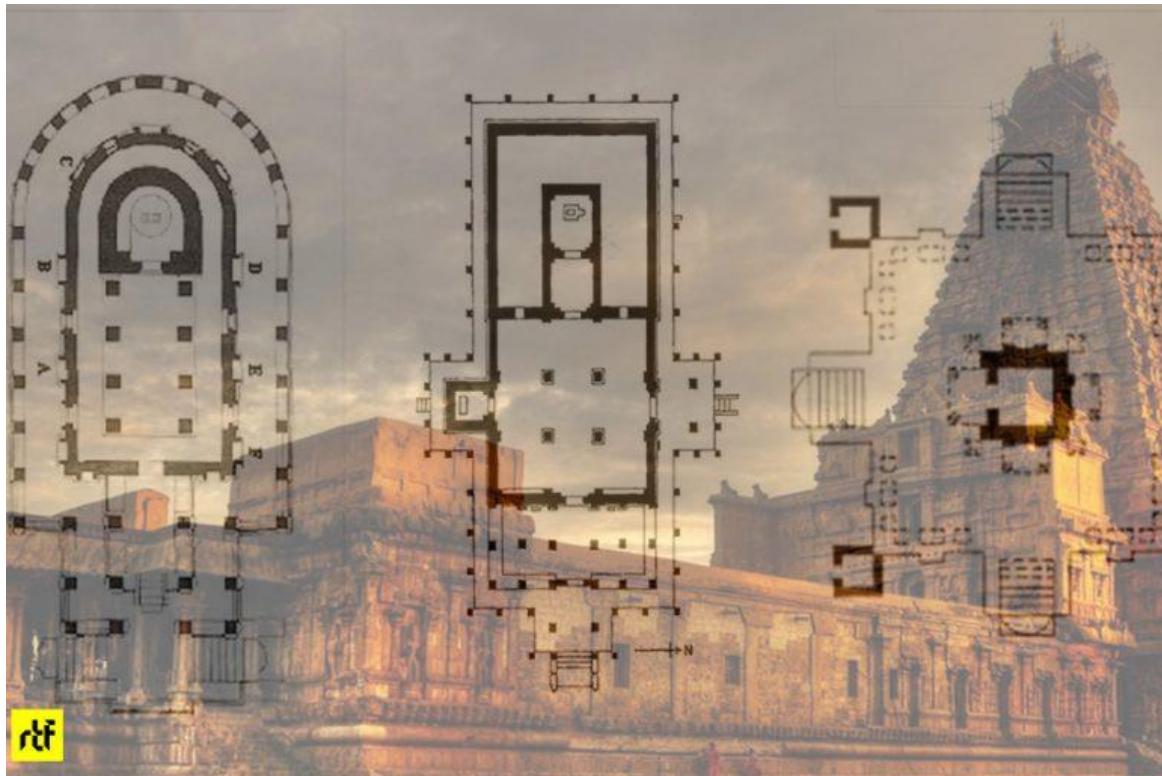
The implementation of fractal geometry ensures that the underlying structure resemble the structure found in nature and hence provides the temple with its aesthetic appeal. It has been noticed that, not only does the physical manifestation follow the principles of fractal geometry, but also the idea of construction, i.e., the concept of the temple and its philosophy, is akin to the concept of fractal geometry and fractal progression. This, points towards the conception that even though the formal theory of fractals had not been developed; like today; at the time of temple construction, the concept existed in the minds of the priest and sthapati. This concept is in tune with the cosmological and philosophical theory attested by the temple structure.

The use of fractal geometry in the construction and design of temples is evident, but the question raised here is, 'why?'. This can be answered by analysing the cosmological and philosophical requirements the temple structure aims to fulfil symbolically, alongside the theory of fractals. The fractals provide a mediatory role and its theoretical application, in the relationship of the philosophical concept and the physical manifestation of a Hindu temple.

Chapter 3

Journey of 4 to South India

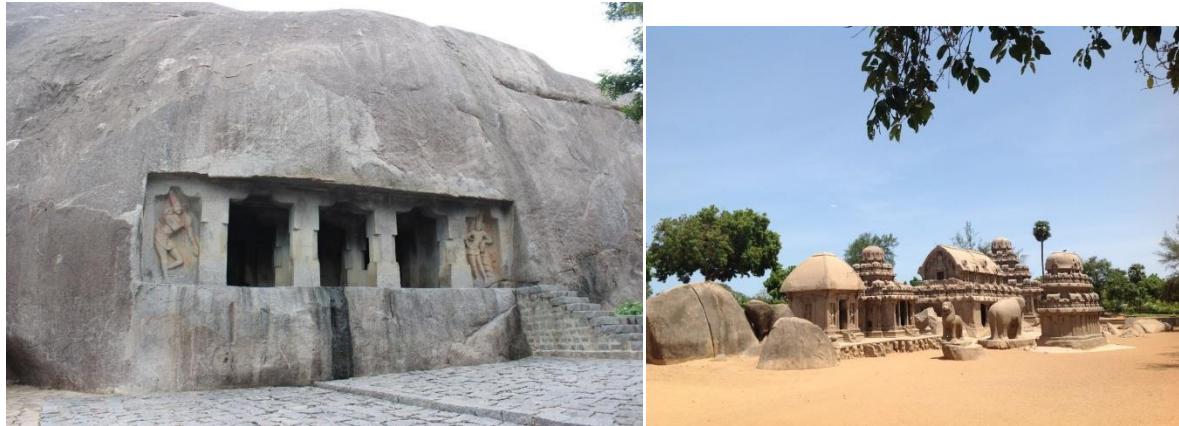
**Dravidian Architecture :History and evolution of Temple Architecture in South India
within the SQUARE plan**



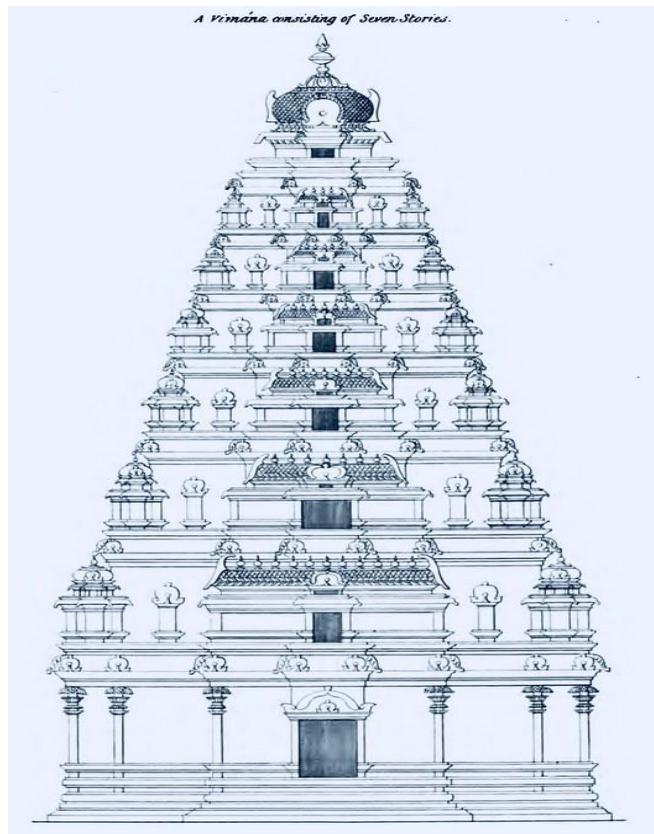
The Dravidian style of temple architecture of South India was pioneered by the Pallavas who reigned in parts of Karnataka, Andhra Pradesh, and northern Tamil Nadu until the ninth century. During the Pallava rule, rock-cut architecture was the most popular construction methodology. Mandagapattu's Laksita Etna rock-cut cave temple was constructed by the Pallava king, Mahendravarman I. The Pancha Pandava caves at Pallavaram and Rudra Saleshwaram cave at Mamandur are amongst the many rock-cut constructions that bloomed during the Pallava rule. The free-standing monolith Rathas (chariots carved out of hard granite) built by King Narsimhavarman Mamalla (a Pallava king), was an important breakthrough in the evolution of Dravidian temple architecture owing to their multi-tiered structure known as Tala.

These Talas are stacked onto each other with the lower tala being wider than the upper one, making it resemble a stepped pyramid. Narsimhavarman Mamalla built a port town called Mamallapuram and carved temples out of a large boulder. Mamallapuram is what we know today as Mahabalipuram – a famous tourist destination. It is said that Mamallapuram was almost a laboratory to the Pallavas, where they experimented with various constructional and sculptural techniques.

The main shrine of the Kailasanathar temple, built in the Pallava capital Kanchipuram, features a Gopuram (temple gateway tower) and an enclosure wall known as Prakara, which surrounds the entire temple complex, with a series of smaller shrines built along its inner face. Both the Gopuram and Prakara are unique features of the Dravidian temple architecture.



Lakshitayatna cave temple (Mandagapattu) /Five Rathas at Mahabalipuram,Tamil Nadu



Talas stacked to form a VimanaBy Ms Sarah Welch

After the Pallava rule came the mighty Chola dynasty. The Cholas ruled their territory for more than four centuries and had held onto their ancient capital of Uraiyur in Trichy. The Chola rule was a golden period for art and architecture. The Chola dynasty spread its influence over large portions of Thanjavur, Trichy, Mayiladuthurai, and Pudukkottai.

Having defeated the Pallavas they had a big challenge to face when it came to rule over a region that had seen the glorious rule of the Pallavas as well as their iconic rock-cut architecture and built architecture at Mamallapuram and Kanchipuram (the Pallava capital) respectively. The

early medieval Chola architecture drew several concepts from the architectural style of the Pallavas. Most of the temple structures constructed by the medieval Cholas were erected using local chieftains and were entirely built in stone; found in the Pudukkottai district of Tamilnadu. VijayalayaCholeesvaram, a ninth-century Shiva temple located in Narthamalai, was named after the first Chola king Vijayala.

This temple is known for its unconventional plan where the sanctum is circular and its Prakara (enclosure wall) is square-shaped. MoovarKoil is another landmark in early medieval Chola architecture. MoovarKoil meaning temple of three Gods in Tamil is a tenth-century construction which is located at Kodumbalur near Pudukkottai. At the MoovarKoil, one can observe the transition from non-refined sculptural form to delicate sculptural figures, attributed to the Pallava influence.



Kailashnathar temple By Keshav Mukund Kandhadai ©commons.wikimedia.org



MoovarKoilBy Kasiarunachalam ©commons.wikimedia.org

Brihadeeswarar temples at Thanjavur and Gangaikondacholapuram are two of the greatest examples of Dravidian architecture. Both the temples are massive structures constructed out of large blocks of granite. An astonishing fact about this temple is that its sixteen storeyed Vimana (diminishing pyramid) is topped by a massive stone weighing eighty thousand kilograms. It is a mystery to this day as to how such a heavy stone was lifted to such a great height.



Brihadeesvara Temple ©upload.wikimedia.orgNandi-an unique feature of Dravidian architecture

The Dravida architecture reached its peak at the time when the power of the Cholas started declining. The Pyramidal Vimana is placed on a square base, the Vimana tower structures are constructed by superimposing diminishing storeys over one another, the Hara (a horizontal row on each storey consisting of miniature shrines) are distinct features of South India's Dravidian architecture. In the Dravida temple design, the main structure is divided into Garbhagriha (Sanctum), Mahamandapa (closed hall), Mandapa (semi-closed hall), Ardha Mandapa (porch), and Natya Mandapa (for classical dance performances). Gopurams (temple gateway towers) are one of the most distinctive features of the Dravidian temples. Both Vimanas and Gopurams have had their pyramidal structure divided into many diminishing storeys. An enclosure wall is known as Prakara that encompassed the entire temple complex within. Depending on the size of the temple, the number of concentric Prakaras is chosen. A water tank near the temple for ritualistic purposes and large Nandis (gate-guardian deity of Kailasa, the abode of Lord Shiva) with a mandapa of their own, are other overwhelming features of the Dravidian form.

After the collapse of the Cholas in the nineteenth century, the Pandiyas came back to power. However, Pandiyas did not focus on creative architecture unlike the Cholas and rather concentrated on building Gopurams to the existing temples. The main contribution of Pandiyas was on the development of temple gateways; they constructed the gateways at the Jambukeshwara temple and the eastern Gopuram of the Thillai Nataraja temple.

Vijayanagara Empire that came into being in 1336 CE, though concentrated on building new temples in and around their capital Hampi, also made significant additions to older existing Pallava and Chola temples by constructing high gopurams known as Raya Gopurams and Kalyana mandapam (marriage halls). An important example of the Vijayanagara era is the Hall of Thousand Pillars in Ranganathaswamy temple at Srirangam constructed during the years

1336–1565 CE. The pillars are beautifully carved with sculptures of wildly rearing horses bearing riders on their backs.

Hall of Thousand Pillars in Ranganathaswamy temple at Srirangam



Madurai Meenakshi Amman temple ©upload.wikimedia.org

After the collapse of the Vijayanagara Empire, various Nayakas (the militants of the Vijaynagar Empire) were declared independent. These Nayaka rulers include the Thanjavur Nayakas, Gingee Nayaks, and Madurai Nayaks. The Nayaka rulers continued the legacy of their previous masters and added glory to the existing temple complexes by building various halls and gopurams. The southern Gopuram at Madurai's Meenakshi Amman temple is undoubtedly one of the most significant contributions to the development of Gopurams by the Nayakas. The collapse of the Vijayanagara Empire and the declaration of independence of various Nayakas under them marked the last phase of the ever-living Dravidian temple architecture of Southern India. 7

Chapter 4

Layouts of Angkor Mandirs- within the Square(4)

VISUAL NATURE OF SPACE

A spatial experience is a multi-sensorial and simultaneous experience that involves built environments, people, context and purposes and is capable of enhancing emotional connection within space. Experiencing space is a subtle act of the human body and mind. We use our eyes to visually probe a space, making thousands of subconscious computations every second. Spatial experience is not restricted to the interiors of buildings. The sensations one has in nature's open spaces may be re-created by art. Temples, Cathedrals, City squares and even gardens, achieve a variety of expression comparable with that of interiors. The exterior of a single building, particularly one that is isolated from other architecture, does not create a space. It occupies the space of nature.

Thus, it may be experienced as sculpture, in terms of the play of masses in a void. The aesthetics of masses, like that of spaces, is rooted in one's psychology. When a tall temple or

a mountain is called majestic, we are projecting human attributes. To arouse predictable patterns of experience architects try to plan monuments to praise humanity and the divine.

When one stands to observe even the simplest building, parts of it will be out of sight. To appreciate spaces, movement is required and consequently PERIFEREY or what we call LAYOUT.

Most of the architectural remains that survive from Ancient and Medieval India are religious in nature. In different parts of the country, distinct architectural style of temples was result of geographical, ethnic and historical diversities. Two broad orders of temples in the country are known as Nagara in the north and Dravida in the south. At times, the Vesara style of temples is also found as an independent style, created through the selective mixing of the Nagara and Dravida orders. As temples grew more complex, more surfaces were created for sculpture by adding more and more rhythmically projecting, symmetrical walls and niches, without breaking away from the fundamental plan of the shrine.

The basic form of the Hindu temple comprises the following:

1. Sanctum (garbhagriha literally ‘womb-house’)

It was a small cubicle with a single entrance which grew into a larger chamber in time. It is made to house the main icon.

▪ Entrance to the temple

It may be a portico or colonnaded hall that incorporates space for a large number of worshippers and is known as a **mandapa**.

▪ Freestanding temples tend to have a mountain-like spire

It can take the shape of a curving **shikhar** in North India and a pyramidal tower, called a **vimana**, in South India.



- **The vahan**

It was mount or vehicle of the temple's main deity along with a standard pillar or dhvaj is placed axially before the sanctum.

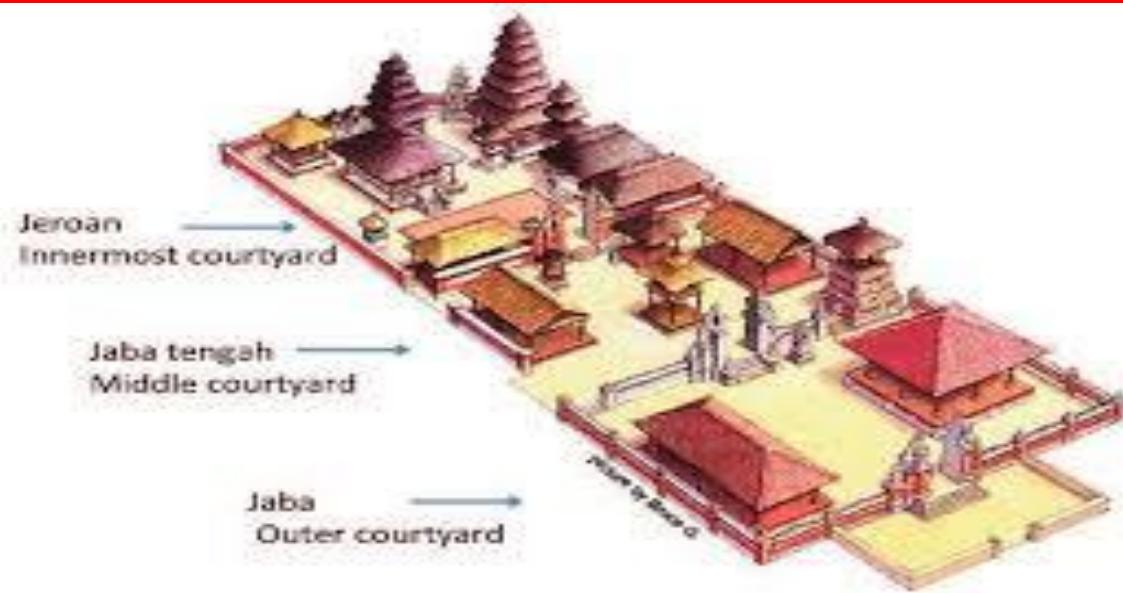
- Many Hindu temples, feature **mithun (embracing couple) sculptures**, considered auspicious. Usually, they are placed at the entrance of the temple or on an exterior wall or they may also be placed on the walls between the mandapa and the main shrine.

Nagara or North Indian Temple Style

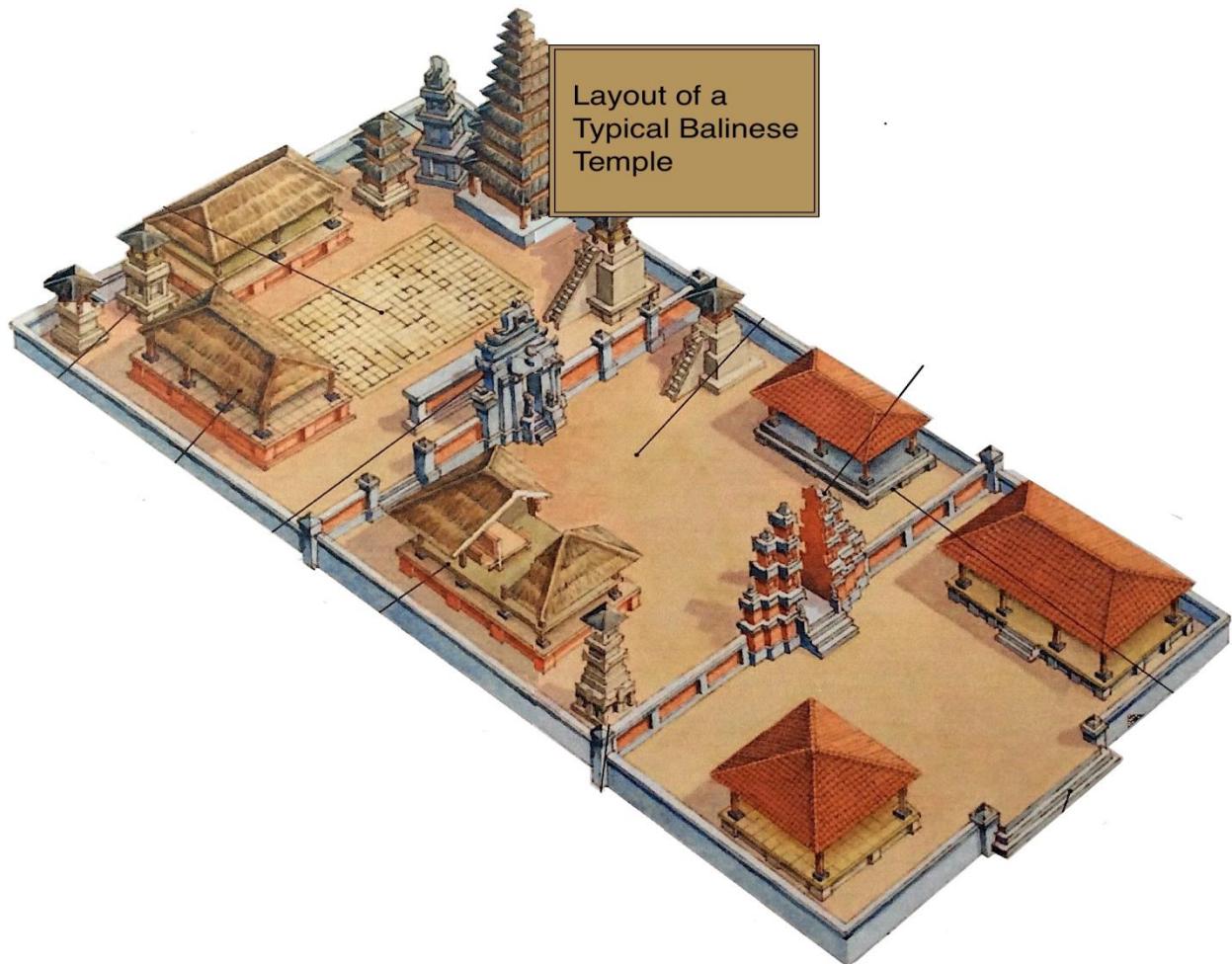
- In North India it is common for an entire temple to be built on a stone platform with steps leading up to it.
- Further, unlike in South India it does not usually have elaborate boundary walls or gateways.
- While the earliest temples had just one tower, or shikhara, later temples had several.

- The garbhagriha is always located directly under the tallest tower.
- There are many subdivisions of nagara temples depending on the shape of the shikhara.
- There are different names for the various parts of the temple in different parts of India; however, the most common name for the simple shikhara which is square at the base and whose walls curve or slope inward to a point on top is called the '**latina**' or the rekha-prasada type of shikara.
- The second major type of architectural form in the nagara order is the **phamsana**, which tends to be broader and shorter than latina ones.
 - Their roofs are composed of several slabs that gently rise to a single point over the centre of the building, unlike the latina ones which look like sharply rising tall towers.
- The third main sub-type of the nagara building is generally called the **valabhi type**.
 - These are rectangular buildings with a roof that rises into a vaulted chamber.

Balinese Hindu temple as an example



example



Typical Balinese temples are divided into three areas, as shown in the photo to the left. They are the *Jaba* or outer courtyard, the *Jaba Tengah* middle courtyard, and the *Jeroan*--the innermost and sacred courtyard. The features of these three courtyards can be seen more clearly in the larger diagram below.

Introductory Concepts -The Importance of a site

What is the site of construction?

From the above simple example of a Balinese site we can construe that construction site is an area or piece of land where construction work is taking place. Sometimes construction sites are referred to as 'building sites'. This usually implies that buildings or houses are being constructed, whereas 'construction site' covers concepts-a wider scope of work. The term 'building site' is often used interchangeably with construction site, although this tends to indicate that buildings (and sometimes, more specifically, housing) are being constructed, whereas the term 'construction site' can refer to all types of works, such as road construction, sewer construction.

Location or site means the specific place or position of a proposed or existing sign.
What is the site area for planning?

Site area (SA): the total land area on which development authorisation is sought, measured on a horizontal plane.

Net development area (NDA): the extent of the site area upon which one or more buildings or other operations and their ancillary space can be built, measured on a horizontal plane.

What is site location in architecture?

Location – **where the site is situated.** Neighbourhood context – the immediate surrounding of the site including data on zoning and buildings and other impacts on our project. Zoning and size – dimensional considerations such as boundaries, easements, height restrictions, site area, access along with any further plans.



What is construction site analysis?

Site analysis is a preliminary phase of architectural and urban design processes dedicated to the study of the climatic, geographical, historical, legal, and infrastructural context of a specific site. Site surveys are inspections of an area where work is proposed, to gather information for a design or an estimate to complete the initial tasks required for an outdoor activity. It can determine a precise location, access, best orientation for the site and the location of obstacles. The type of site survey and the best practices required depend on the nature of the project.

Examples of projects requiring a preliminary site survey include urban construction. Today, typically of a tight grid of high resolution (high frequency) reflection seismology profiles to look for possible gas hazards in the shallow section beneath the seabed and detailed bathymetric data to look for possible obstacles on the seafloor (e.g. shipwrecks, existing pipelines) using multibeam echosounders.

What is a layout plan?

A **site layout plan**, sometimes called a block plan, shows a detailed layout of the whole site and the relationship of the proposed works with the boundary of the property, nearby roads, and neighbouring buildings.

What is layout example?

The **definition of a layout** is an arrangement, plan or design. An example of a layout is a drawing of how a house will be built. (informal) An establishment or property, especially a large residence or estate.

What is a layout in design?

Layout design is the process of arranging visual and textual elements on-screen or on-paper in order to grab a reader's attention and communicate information in a visually appealing way.

What is layout and its purpose?

The **basic objective of layout** is to ensure a smooth flow of work, material, and information through a system. The basic meaning of facility is the space in which a business's activities take place.

What is good layout?

A **good layout** would be able to co-ordinate all operations. The layout should be designed taking into account the inter-relationships between various equipment, departments and personnel. It is therefore important that while planning the layout the complete picture of the organization is considered.



Angkor Model



What is the layout of a building called?

Plan view or planform is defined as a vertical orthographic projection of an object on a horizontal plane, like a map. The term may be used in general to describe any drawing showing the physical layout of objects.

In architecture and building engineering, a floor plan is a technical drawing to scale, showing a view from above, of the relationships between rooms, spaces, traffic patterns, and other physical features at one level of a structure.

Dimensions are usually drawn between the walls to specify room sizes and wall lengths. Floor plans may also include details of fixtures like sinks, water heaters, furnaces, etc. Floor plans may include notes for construction to specify finishes, construction methods, or symbols for electrical items.

It is also called a *plan* which is a measured plane typically projected at the floor height of 4 ft (1.2 m), as opposed to an *elevation* which is a measured plane projected from the side of a building, along its height, or a section or *cross section* where a building is cut along an axis to reveal the interior structure.

Similar to a map, the orientation of the view is downward from above, but unlike a conventional map, a plan is drawn at a particular vertical position (commonly at about four feet above the floor). Objects below this level are seen, objects at this level are shown 'cut' in plan-section, and objects above this vertical position within the structure are omitted or shown dashed. Plan view or planform is defined as a vertical orthographic projection of an object on a horizontal plane, like a map.

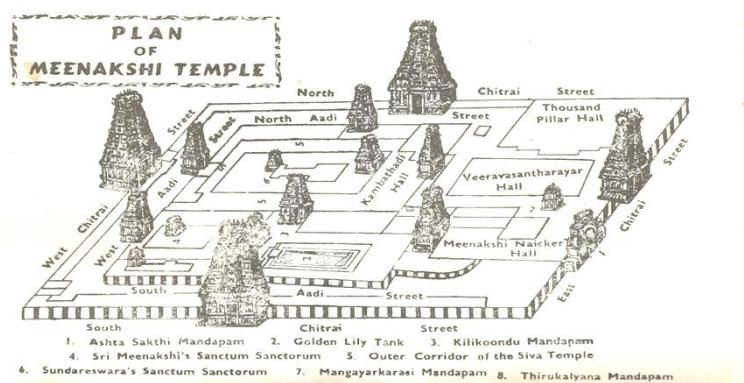
The term may be used in general to describe any drawing showing the physical layout of objects. For example, it may denote the arrangement of the displayed objects at an exhibition, or the

arrangement of exhibitor booths at a convention. Drawings are now reproduced using plotters and large format xerographic copiers.

A reflected ceiling plan (RCP) shows a view of the room as if looking from above, through the ceiling, at a mirror installed one foot below the ceiling level, which shows the *reflected* image of the ceiling above. This convention maintains the same orientation of the floor and ceilings plans – looking down from above. RCPs are used by designers and architects to demonstrate lighting, visible mechanical features, and ceiling forms as part of the documents provided for construction.

The art of constructing ground plans (ichnography; "track, trace" and "to write"; was first described by Vitruvius and included the geometrical projection or horizontal section representing the plan of any building, taken at such a level as to show the outer walls, with the doorways, windows, fireplaces, etc., and the correct thickness of the walls; the position of piers, columns or pilasters, courtyards and other features which constitute the design, as to scale.

Building blocks



Floor plans use standard symbols to indicate features such as doors. This symbol shows the location of the door in a wall and which way the door opens. A floor plan is not a top view or birds eye view. It is a measured drawing to scale of the layout of a floor in a building. A top view or bird's eye view does not show an orthogonally projected plane cut at the typical four foot height above the floor level. A floor plan could show:

- interior walls and hallways
- restrooms
- windows and doors
- appliances such as stoves, refrigerators, water heater etc.
- interior features such as fireplaces, saunas and whirlpools
- the use of all rooms

Plan view

A plan view is an orthographic projection of a three-dimensional object from the position of a horizontal plane through the object. In other words, a plan is a section viewed from the top. In such views, the portion of the object above the plane (section) is omitted to reveal what lies beyond. In the case of a floor plan, the roof and upper portion of the walls may typically be omitted. Whenever an interior design project is being approached, a floor plan is the typical starting point for any further design considerations and decisions.

Roof plans are orthographic projections, but they are not sections as their viewing plane is outside of the object.

A plan is a common method of depicting the internal arrangement of a three-dimensional object in two dimensions. It is often used in technical drawing and is traditionally crosshatched. The style of crosshatching indicates the type of material the section passes through.

The Plan of Hindu temple architecture

Hindu temple architecture as the main form of Hindu architecture has many varieties of style, though the basic nature of the Hindu temple remains the same, with the essential feature an inner sanctum, the *garbha griha* or womb-chamber, where the primary *Murti* or the image of a deity is housed in a simple bare cell. This chamber often has an open area designed for movement in clockwise rotation for rituals and prayers. Around this chamber there are often other structures and buildings, in the largest cases covering several acres. On the exterior, the garbhagriha is crowned by a tower-like *shikhara*, also called the *vimana* in the south. The shrine building often includes an circumambulatory passage for parikrama, a mandapa congregation hall, and sometimes an antarala antechamber and porch between garbhagriha and mandapa. There may be other mandapas or other buildings, connected or detached, in large temples, together with other small temples in the compound.

Hindu temple architecture reflects a synthesis of arts, the ideals of dharma, values and the way of life cherished under Hinduism. The temple is a place for *Tirtha*—pilgrimage.^[2] All the cosmic elements that create and celebrate life in Hindu pantheon, are present in a Hindu temple—from fire to water, from images of nature to deities, from the feminine to the masculine, from kama to artha, from the fleeting sounds and incense smells to Purusha—the eternal nothingness yet universality—is part of a Hindu temple architecture.^[2] The form and meanings of architectural elements in a Hindu temple are designed to function as the place where it is the link between man and the divine, to help his progress to spiritual knowledge and truth, his liberation it calls moksha.

The architectural principles of Hindu temples in India are described in Shilpa Shastras and Vastu Sastras. The Hindu culture has encouraged aesthetic independence to its temple builders, and its architects have sometimes exercised considerable flexibility in creative expression by adopting other perfect geometries and mathematical principles in *Mandir* construction to express the Hindu way of life.^[6]

Early structures

Excavation of the huge Temple of Vāsudeva next to the Heliodorus pillar in Besnagar. Show that the Temple measured 30x30 meters, and the walls were 2.4 meters thick. Pottery remains assigns the site to the 2nd century BCE. Further excavations also revealed the outline of a smaller elliptic temple structure, which was probably destroyed by the end of the 3rd century BCE. The platform and the base of the Heliodorus pillar are visible in the immediate background.

Remains of early elliptical shrines discovered in Besnagar (3rd-2nd century BCE) and Nagari (1st century BCE), may be the earliest known Hindu temple structures, associated to the early Bhagavata tradition, a precursor of Vaishnavism.

Steps in Temple Construction

Steps in Temple Construction: The procedure for building a temple is extensively discussed, and it could be expressed in short as "Karshanadi Pratisthantam", meaning beginning with "Karshana" and ending with "Pratista". The details of steps involved vary from one Agama to another, but broadly these are the steps in temple construction:

1. Bhu pariksha: Examining and choosing location and soil for temple and town. The land should be fertile and soil suitable.
2. Sila pariksha: Examining and choosing material for image
3. Karshana: Corn or some other crop is grown in the place first and is fed to cows. Then the location is fit for town/temple construction.
4. Vastu puja: Ritual to propitiate vastu devata.
5. Salyodhara: Undesired things like bones are dug out.
6. Adyestaka: Laying down the first stone
7. Nirmana: Then foundation is laid and land is purified by sprinkling water. A pit is dug, water mixed with navaratnas, navadhanyas, navakhaniyas is then put in and pit is filled. Then the temple is constructed.
8. Murdhestaka sthapana: Placing the top stone over the prakara, gopura etc. This again involves creating cavities filled with gems minerals seeds etc. and then the pinnacles are placed.
9. Garbhanya: A pot made of five metals (pancaloha kalasa sthapana) is installed at the place of main deity.
10. Sthapana: Then the main deity is installed.
11. Pratista: The main deity is then charged with life/god-ness.

Before the temple is opened for daily worship, there are some preparatory rituals to be done, like: Anujna: the priest takes permission from devotees and lord Ganesha to begin rituals Mrit samgrahana: Collecting mud Ankurarpana: Sowing seeds in pots of mud collected and waiting till they germinate Rakshabandhana: The priest binds a holy thread on his hand to take up the assignment. Punyahavacana: Purifying ritual for the place and invoking good omens Grama santi: Worship for the good of village and to remove subtle undesired elements Pravesa bali: Propitiation of various gods at different places in the temple, rakshoghna puja (to destroy asuric elements) and of specific gods like Kshetra palaka (devata ruling the town) Vastu Santi: Pacifying puja for vastu (this happens twice and this is the second time)

Yagasala: Building the stage for homas, along with vedika. Kalasthapanam: Installing kalasam Samskara: Purifying the yaga sala Kalasa puja, yagarambha: Worshipping the kalasa as god and propitiating deities through fire Nayanonmeelana, Pratimadhisava: Opening eyes of the god-image, installing it and giving it life. Then specific worship is done to deity, as prescribed. For instance in the case of Siva, this is followed by astabandhana and kumbhabhisheka. Temple Design From the proportions of the inner sanctum to the motifs carved into the pillars, the traditional temple takes its first form on the master sthapati's drawing board. The architect initially determines the fundamental unit of measurement using a formula called ayadhi. This formula, which comes from Jyotisha, or Vedic astrology, uses the nakshatra (birth star) of the founder, the nakshatra of the village in which the temple is being erected matching the first syllable of the name of the village with the seed sounds mystically associated with each nakshatra and the nakshatra of the main Deity of the temple. This measurement, called danda, is

the dimension of the inside of the sanctum and the distance between the pillars. The whole space of the temple is defined in multiples and fractions of this basic unit. The Shastras are strict about the use of metals, such as iron in the temple structure because iron is mystically the crudest, most impure of metals. The presence of iron, sthapatis explain, could attract lower, impure forces. Only gold, silver, and copper are used in the structure, so that only the most sublime forces are invoked during the pujas. At especially significant stages in the temple construction (such as ground-breaking and placement of the sanctum door frame), pieces of gold, silver and copper, as well as precious gems, are ceremoniously embedded in small interstices between the stones, adding to the temple's inner-world magnetism. These elements are said to glow in the inner worlds and, like holy ash, are prominently visible to the Gods and Devas. The ground plan is described as a symbolic, miniature representation of the cosmos. It is based on a strict grid made up of squares and equilateral triangles which are imbued with deep religious significance. To the priest-architect the square was an absolute and mystical form. The grid, usually of 64 or 81 squares, is in fact a mandala, a model of the cosmos, with each square belonging to a deity. The position of the squares is in accordance with the importance attached to each of the deities, with the square in the center representing the temple deity; the outer squares cover the gods of lower rank.

Agamas say that the temple architecture is similar to a man sitting - and the idol in garbagriha is exactly the heart-plexus, gopuram as the crown etc. The construction of the temple follows in three dimensional form exactly the pattern laid out by the mandala. The relationship between the underlying symbolic order and the actual physical appearance of the temple can best be understood by seeing it from above which was of course impossible for humans until quite recently. Another important aspect of the design of the ground plan is that it is intended to lead from the temporal world to the eternal. The principal shrine should face the rising sun and so should have its entrance to the east. Movement towards the sanctuary, along the east-west axis and through a series of increasingly sacred spaces is of great importance and is reflected in the architecture. A typical temple consists of the following major elements 1. an entrance, often with a porch. one or more attached or detached mandapas or halls 3. the inner sanctum called the garbagriha, literally 'womb chamber'- the tower build directly above the garbagriha. Significance of the number eight in temple design Vastu Shastra describes the inner sanctum and main tower as a human form, structurally conceived in human proportions based on the mystical number eight.

According to Dr. V. Ganapati Sthapati, Senior Architect at the Vastu Government College of Architecture, the vibration of the spaceconsciousness, which is called time, is the creative element, since it is this vibratory force that causes the energetic space to turn into spatial forms. Therefore, time is said to be the primordial element for the creation of the entire universe and all its material forms. When these vibrations occur rhythmically, the resultant product will be an orderly spatial form. This rhythm of the time unit is traditionally called talam or layam. Since every unit of time vibration produces a corresponding unit of space measure, vastu science derives that time is equal to space. This rhythm of time and space vibrations is quantified as eight and multiples of eight, the fundamental and universal unit of measure in the vastu silpa tradition. This theory carries over to the fundamental adi talam (eight beats) of classical Indian music and dance. Applying this in the creation of a human form, it is found that a human form is also composed of rhythmic spatial units.

The **Agamas** are a collection of several literature and scriptures of Hindu schools. The term literally means tradition or "that which has come down", and the Agama texts describe cosmology, epistemology, philosophical doctrines, precepts on meditation and practices, four kinds of yoga, mantras, temple construction, deity worship and ways to attain sixfold desires. These canonical texts are in Tamil and Sanskrit. Agamas were predominant in South India but Sanskritized later.



Small Hindu Temple of Kidel, Java- Marianne North

The Vastu-Purusha-Mandala- The goal of a temple's design is to bring about the descent or manifestation of the unmanifest and unseen. The architect or sthapati begins by drafting a square. The square is considered to be a fundamental form. It presupposes the circle and results from it. Expanding energy shapes the circle from the center; it is established in the shape of the square. The circle and curve belong to life in its growth and movement. The square is the mark of order, the finality to the expanding life, life's form and the perfection beyond life and death. From the square all requisite forms can be derived: the triangle, hexagon, octagon, circle etc. The architect calls this square the vastu-purusha-mandalavastu, the manifest, purusha, the Cosmic Being, and mandala. The vastu-purusha-mandala represents the manifest form of the Cosmic Being; upon which the temple is built and in whom the temple rests.

The temple is situated in Him, comes from Him, and is a manifestation of Him. The vastu-purusha-mandala is both the body of the Cosmic Being and a bodily device by which those who have the requisite knowledge attain the best results in temple building. In order to establish the vastu-purusha-mandala on a construction site, it is first drafted on planning sheets and later drawn upon the earth at the actual building site. The drawing of the mandala upon the earth at the commencement of construction is a sacred rite. The rites and execution of the vastupurusha-

mandala sustain the temple in a manner similar to how the physical foundation supports the weight of the building. Based on astrological calculations the border of the vastu-purusha-mandala is subdivided into thirtytwo smaller squares called nakshatras. The number thirty-two geometrically results from a repeated division of the border of the single square. It denotes four times the eight positions in space: north, east, south, west, and their intermediate points. The closed polygon of thirty-two squares symbolizes the recurrent cycles of time as calculated by the movements of the moon. Each of the nakshatras is ruled over by a Deva, which extends its influence to the mandala. Outside the mandala lie the four directions, symbolic of the meeting of heaven and earth and also represent the ecliptic of the sun-east to west and its rotation to the northern and southern hemispheres.

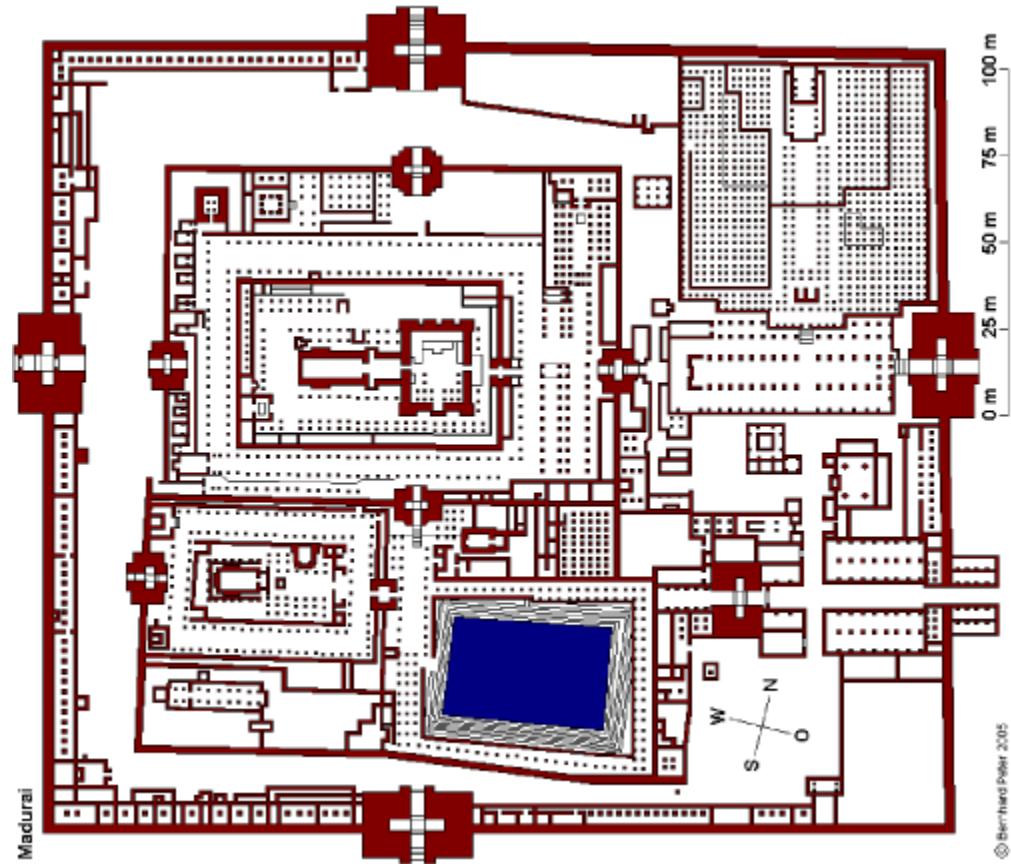
The center of the mandala is called the station of Brahma, the creator of the universe. Surrounding Brahma are the places of twelve other entities known as the sons of Aditi, who assist in the affairs of universal management. The remaining empty squares represent akasha or pure space. The vastupurusha-mandala forms a diagram of astrological influences that constitute the order of the universe and the destinies of human lives. When placed on the building site, along with astrological calculations, can the auspicious time to begin temple construction be determined. The ground breaking ceremony From the diagram of the vastu-purusha-mandala the architect proceeds to develop the vertical and horizontal dimensions of the temple. The plotting graphs of the temple are divided into two main sections-the ground plan and the vertical alignment. The square, the rectangle, the octagon and the pentagon are fundamental patterns in the horizontal or ground plan. In the vertical alignment the pyramid, the circle and the curve are most prominent.

The subdivisions of the ground plan include the brahmasthana (the main shrine and smaller chapels) and the mandapam (balconies, assembly halls and auditoriums). The vertical plan consists of drawings for the gopuram, entrance ways, the vimana, the structure above the main shrine, and the prakara, walls. The brahmasthana is the principal location in a temple and is where the seat of the presiding Diety will be placed. At the base of the foundation of the brahmasthana, located at the station of Brahma on the vastu-purusha-mandala, a ritual called the garbhadhana is performed called. The ritual invites the soul of the temple to enter within the buildings confines. During this ritual, a golden box is placed in the earth as part of the ground-breaking ceremony. The interior of the box is divided into smaller units exactly resembling the vastu-purusha-mandala. All the units of the gold box are first partially filled with dirt. In the thirty-two units representing the nakshatras, the units of Brahma, and the twelve sons of Aditi, the priest places an appropriate mantra in written form to invoke the presence of the corresponding Devata.

The drawing of the court yard of the Shiva temple at Thiruvālangādu, by Tamil illustrator, best known for his detailed renditions of Tamil architecture and sculpture P.M. Sreenivasan (1919-1983), who adopted the name Silpi,

Having determined the suitability of the land for constructing a temple, and having drawn up the Vastu Mandala of the town and identified the temple location ; the next stage is to draw up a construction plan. This specifies the location, the size and the orientation of the various temples to come up in the proposed complex. This again involves preparation of another Vastu Mandala.

Pada Vinyasa: In Vastushastra (architecture means “scheme of plot- or disposition”). This is the name of secondary conceptual instruments, used in the art of ancient Hindu architecture (*vāstuśāstra*). This term is commonly used in literature such as the *Mānasāra*. It is a particular diagram (one only) traced on the building terrain during the padavinyāsa ceremony, before starting the construction. Each square of a diagram is assigned to a different deity. In certain texts, the compartments (*koṣṭha*) of the deposit casket are referred to by the names of deities associated with the plots of the site diagram. In the *Kāsyapaśilpa* there are the letters of the Sanskrit ‘alphabet’ and the names of the eight *Vidyēśvaras* assigned to or placed in the casket at the beginning of the ceremony, which serve as menas of identifying the compartments later on.¹



Temple layout Sreeneevasan's Blog

It is the process under which the Mandala (architectural plan which represents the cosmos) is put to use in site planning and architecture - a method whereby any site can be divided into grids/modules or pada. Depending on the position of the gods occupying the various modules, the zoning of the site and disposition of functions in a building are arrived at. A Mandala They are proportional relationships of the squares and the diagonals. The text first gives a list of thirty-two such schemes.

2. sakala, whole; 2. pecaka, couch; 3. pīṭha, pedestal; 4. mahāpīṭha, great pedestal; 5. upapīṭha, low pedestal; 6. ugrapīṭha, high pedestal; 7. sthanḍila, altar; 8. candita, circumcised; 9. paramaśayika, primal rectiner; 10. āsana, seat; 11. sthāniya, local; 12. deśya, regional; 13. ubhayacandita; twice-circumcised; 14. bhadra, auspicious; 15. mahāsana, great seat; 16. padmagarbha; lotus-womb; 17. triyuta; thrice-yoked; 18.

karṇāṣṭaka, eight-cornered; 19. gaṇita; computed; 20. sūryaviśālaka, extensive as the sun; 21. susaṁhita, well-endowed; 22. supratikānta, beautiful rival-spouse; 23. viśālaka, capacious; 24. vipragarbha, Brāhmaṇa-womb 25. viśveśa; lord of the world; 26. vīpulahhoga, copious enjoyment; 27. vīprakānta; Brāhmaṇa-spouse 28. viśālākṣa, large-eyed; 29. vīprabhakti, Brāhmaṇa's portion; 30. viśeśasāra, essence of lord of the world, 31. īśvarakānta; lord's spouse, 32. candrakānta, moon's spouse.

Among these thirty-two schemes, only seven are treated in more detail: sakala, single-plot (which does not have much detail, to begin with); pecaka, four-plot; pīṭha, nine-plot; mahapīṭha, sixteen-plot; upapīṭha, twenty-five-plot; maṇḍuka, sixty-four-plot, and paramaśayika, eighty-one-plot, schemes. The further elaboration of these schemes includes the assignment of deities to the plots. The padavinyāsa, placing (marking) of the plots and assigning deities on the floor of the pavilion and on the altar, is conducted next (see Mānasāra chapter 70). He marks either the sthaṇḍila of forty-nine squares or the pīṭha of nine squares with grain powder on the floor of the pavilion. On the altar, he marks either the upapīṭha diagram of twenty-five plots or pīṭha of nine plots. He also marks two circles, one on the floor of the pavilion and the other on the altar. During padavinyāsa, ritual marking of the plots in the delineated site, the sthapati visualizes the form of vāstupuruṣa, man or “spirit” of the site (who “inhabits” it), as lying face down and stretched out across it, while reciting the mantra of obeisance to him. He also visualizes the vāstumāṇḍala, cluster of forty-five deities, who, in order to subjugate vāstupuruṣa, sit upon his limbs and thus occupy plots in the four quarters of the site. He invokes the deity corresponding to each plot and “situates” it thereupon by touching the plot and visualizing its form in all iconic detail and vocalizing its specific venerational mantra.

2) Padavinyāsa scheme of plot-disposition”.—Chapter VII of the Mānasāra is titled Padavinyāsalakṣaṇam, “Characteristics of the Disposition of Plots”. The chapter outlines a number of schemes by which the delineated site is divided into plots. A typical scheme of plot-disposition is a conceptual instrument intended to “order” the delineated site. This tool is constructed out of geometrical and numerical principles of quadratic division. Therefore the number of plots in the scheme is always a perfect square.

Land: The land considered suitable for the purpose of constructing the temple (vastu bhumi) and placed at the center (Brahma Sthana) of the Vastu mandala of the township must be in the shape of a rectangle or a square. The ratio between the breadth and the length of the area may be 4:8; 4:7; 4:6; or 4:5. (The square would be 4:4). Shapes of sites to be avoided are: 1. circular (vṛitta), 2. triangular (trikona), 3. rod shaped (dandakriti), 4. bow shaped (dhanur akara) 5. other irregular shapes. And, in case it becomes necessary to construct a temple on a land of such “un approved” shape, the area meant for the temple should be demarcated and rendered a square or a rectangle in shape. Buddhist and Jain temples too follow the same principles. Even the Sri Harmandir Sahib, the Golden Temple at Amritsar is structured in a square shape; with the Sanctum placed in the Brahma sthana. In case of a rectangular site, it must have north – south orientation. The depth of the site (Aaya-profit) should be more than its breadth (vyaya-loss). That is the reason we find our temple walls (prakara) on north-south shorter than the walls on east-west. The slope of the land surrounding the temple in the east and the north direction should be in the northeast corner. Fountains or lotus ponds of the temple should be in the northeast direction. In the open space surrounding the temple, Tulsi (Basil) plants with raised bed should

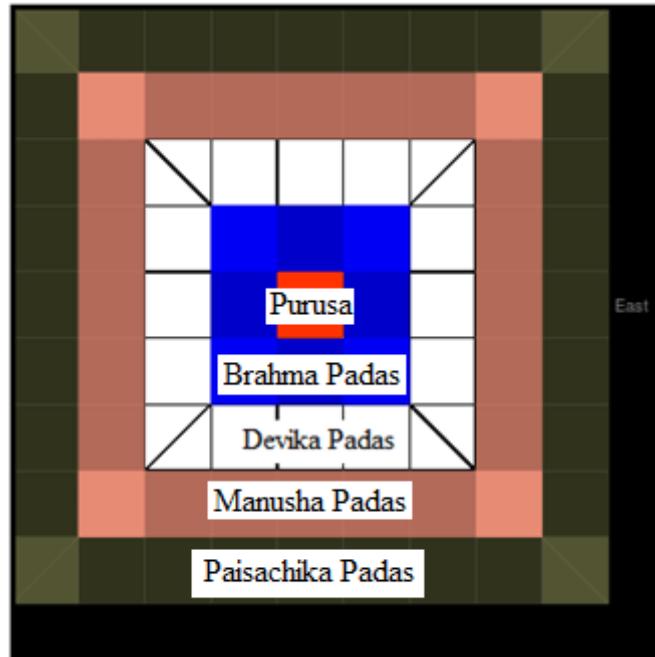
be in the east; the Jasmine, white Champak, Star Coral plants etc. should be in the northwest corner or the east. Four approach roads are much recommended. The preliminaries for construction of a shrine include preparations of a plan, Vastu Purusha Mandala, a Yantra, with unit cells (pada) of 64, 81 or 256 in number. The entire process is rich in symbolism. The square shape of the Mandala is symbolic of earth, signifying the four directions which bind and define it; and the Vastu is the extent of existence in its ordered site; Purusha being the source of existence. The ground plan, again, is symbolic and is the representation of cosmos in miniature. The Vastu Purusha represents terrestrial world with constant movements. The grid made up of squares and equilateral triangles is imbued with religious significance; with each cell belonging to a deity. The position of the deity is in accordance to the importance assigned to him .The central portion of the square (Brahma Sthana) is occupied by the presiding deity of the temple ; while the outer cells house deities of lower order.

Another important aspect of the design of the ground plan is that it is intended to lead from the temporal world to the eternal. The principal shrine should face the rising sun and so should have its entrance to the east. Movement towards the sanctuary, along the east-west axis and through a series of increasingly sacred spaces is of great importance and is reflected in the architecture. This process of drawing the Mandala , known as Pada-vinyasa or Vastu mandala Vinyasa is essential not only for construction of the main temple but also for deciding upon the location, the orientation and the size of the sanctum; and for placement of retinue-divinities. Let us look at the following example of an 81 cell parama-saayika layout.

The site-plan is to be regarded as the body of the Vastu-purusha whose height extends from Pitrah (in the bottom left corner) to Agni (top right corner). The Vastu purusha mandala is in some ways a development of the four pointed or cornered earth mandala having astronomical reference points. The mandala of 81 squares has 32 squares around the border representing the four cardinal points and the lunar constellations. It is the representation of all cyclical time; lunar and solar. Brahma is the God at the centre. The Manduka Mandala (8×8) the whole square would be divided by the two axes that go North-south and East-west.

In the case of Parama Saayika Mandala (9×9)- the entire square would be unevenly divided.

The center of the mandala consisting nine cells is dedicated to Brahma, the first of beings and the engineer of universal order. The Three cells to its east are for Aryaman, three cells to its west are for Mitra and three cells to its north are for Prihvidhara. In this site plan 32 spirits reside in the outer ring. There are 8 spirits in four corners. There are four spirits surrounding Brahma. Thus there are in all 45 spirits (including Brahma). Dikpalas or guardian deities of different quarters, who assist in the affairs of universal management, are an important part of the Vastu. Indra, Agni, Yama, Niritti, Varuna;, Vayu , Kubera and Isana; reside in the East , South-East , South, South-West, West, North-West, North and North-East respectively. All except Kubera are principal Vedic deities. This provides a method that determines the requirements of architecture in relation to its directions. Establishing Vastu Mandala on the site The vastu-purusha-mandala, forming a sort of map or diagram of astrological influences that constitute the order of the universe, is now complete. When placed on the building site the vastupurusha-mandala determines the positions and orientations of the temples and the time for



commencing the construction. Only by the combination of the vastu-purusha-mandala and the astrological calculations can this factor be ascertained. Horizontal and vertical dimensions: From the diagram of the vastu-purusha-mandala the architect next proceeds to develop the vertical and horizontal dimensions of the temple. The square, the rectangle, the octagon and the pentagon are fundamental patterns in the horizontal or ground plan. In the vertical alignment the pyramid, the circle and the curve are more prominent. The subdivisions of the ground plan include thebrahmasthana (the main shrine and smaller chapels) and the mantapa(balconies, assembly halls and auditoriums).

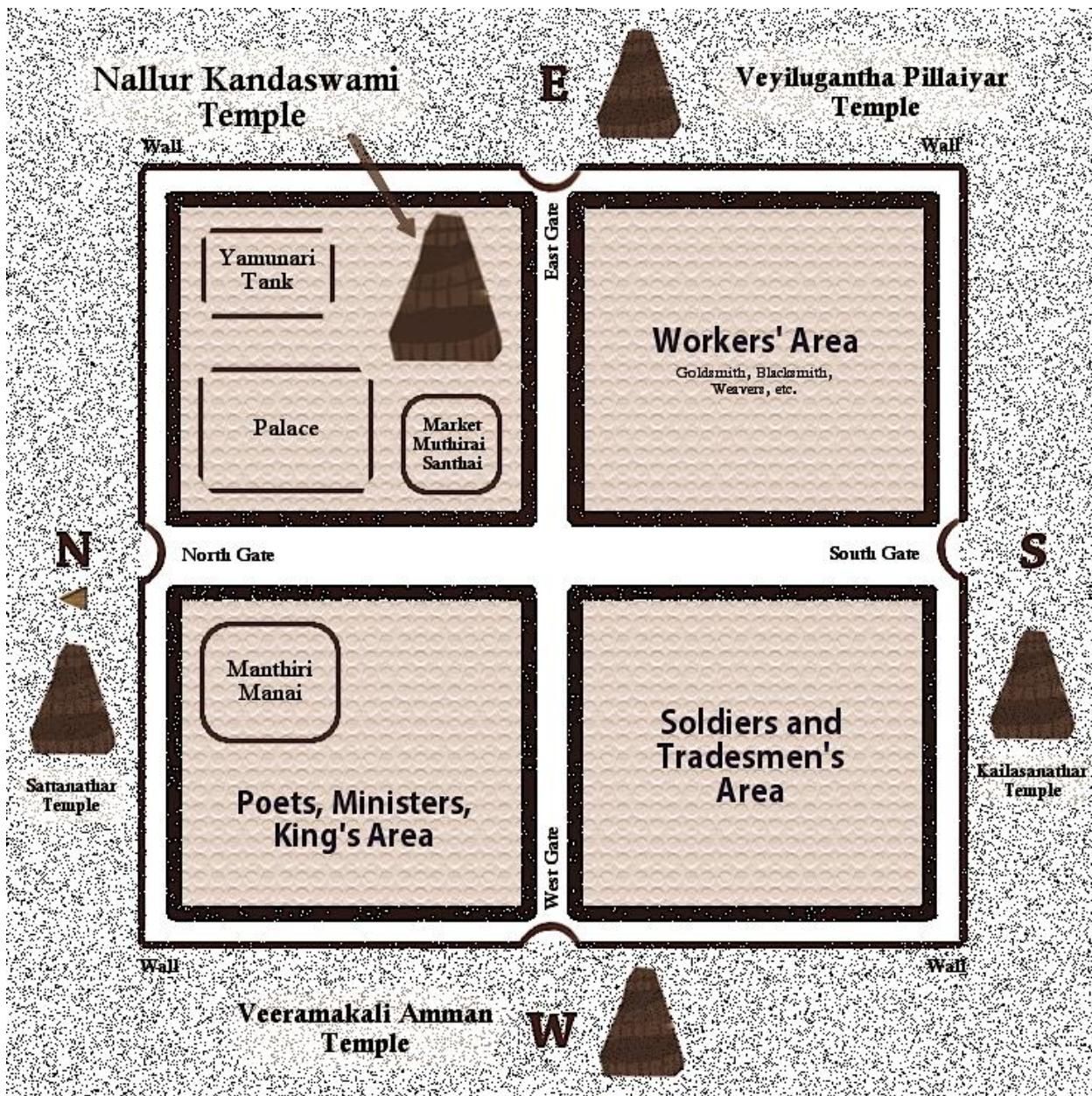
The vertical plan consists of drawings for the gopura (entrance ways), the vimana (the structure above the main shrine or chapel) and the prakara (the walls). The construction of the temple follows in three dimensional forms, in exactly the patterns laid out by the mandala. The relationship between the underlying symbolic order and the actual physical appearance of the temple can best be understood by viewing it from above (top elevation). In order to establish the vastu-purusha-mandala on the construction site, it is first drafted on planning sheets and later drawn upon the earth at the actual building site. The ground for civil construction is demarcated by dividing the site into 81 cells, by drawing 10 lines from East to West and 10 lines from North to South in which Vastu Mandala deities are installed. In addition the deities of the Sarvathobhadra-mandala are also established after performing Vastu Homa. The drawing of the mandala upon the earth at the commencement of construction is a sacred rite in itself. The cells sustain the temple in their own sphere of effectiveness, in the manner that the actual foundation supports its weight. Vastu Shanti Puja is a spiritual and religious process to offer prayers to the Vastu Purush who is the Lord, protector and soul of the house and seek the blessings for positivity and prosperity. During this worship, people also pay their tribute to the deity of directions, five elements of nature, and natural forces. Some of the major objectives of performing Vastu Shanti Pooja are – To eliminate any kind of faults relating to interiors exteriors, or structures of buildings. To seek forgiveness of God for the damage done to the

nature during construction. To ask for the blessings of Vastu Purush for happiness, wealth and good health. Offer prayers to Vastu Purush for protection of home or office from natural calamities. To appease any form of supernatural force which might be dangerous for the occupants

Significance of Vastu Shanti Puja **Vastu** is a place where nature and human beings live together in harmony. Vastu Shanti Puja, also known as Vastu Dosh Nivaran Puja, brings a striking balance between both of them by removing all the hurdles or negativities present in the environment and preventing unforeseen destruction and misfortune to finally improve the Vastu of a place. The puja is performed to appease Vastu Devta to seek his blessings and bless one's home or workspace with prosperity and harmony. Vastu Puja is also conducted to reduce the harmful impacts of the Vastu Dosha caused by the construction faults in the Vastu of a place and to maintain a balance between the eight directions and the five elements of nature. People worship Vastu Purush or Vastu deva on several occasions such as land worship, Griha Pravesh, door installation, well mining, foundation laying, foundation mining, and others.

Garbadhana, Shilanyasa is the ceremony for laying foundation stone. It is the laying of the first stone (square in shape) or a brick signifying the start of construction. It is laid in the north-western corner of the building plan, drawn on the ground. After this, the construction of the foundation is taken up. The foundation is built and the ground filled up, up to the plinth level, except in the middle portion of the garbhagraha area, which is filled up three-fourths. The sanctum is technically known as Garba-Griha. This part of the temple is usually constructed first. The ceremony related to it is known as Garba-dana or Garba-nasya; and, it involves letting in to the earth a ceremonial copper pot, containing nine types of precious stones, several metals, minerals, herbs and soils symbolizing creation and prosperity. The following is a little more detail about it.

The Brahmasthana , the principal location in a temple where the Garbagraha will eventually come up, is the nucleus of the Vastu Purusha Yantra. At thebrahmasthana, as drawn on the grounda ritual is performed calledgarbadhana, inviting the soul of the temple (Vastu Purusha) to enter within the buildings confines. In this ritual, a golden box is imbedded in the earth. The interior of the box is divided into smaller units exactly resembling thevastu-purusha-mandala. All the units of the gold box are first partially filled with earth. In the thirty-two units representing the nakshatras (lunar mansions), the units of Brahma and the twelve sons of Aditi, the priest places an appropriate mantra in written form to invoke the presence of the corresponding divinity .An Image of Ananta , the hooded serpent , is also placed in the box. Ananta, meaning eternal or timeless, also represents theenergy that supports the universe. The box also contains nine precious stones – diamonds, emeralds, rubies, pearls, yellow sapphire, and blue sapphire, red coral, cats-eye and jade – to appease the nine planets. A stone slab (adhara-shila) is thereafter placed over the spot the copper pot is buried.And, over this slab will rise the foundation for installing the Mula-bhera.



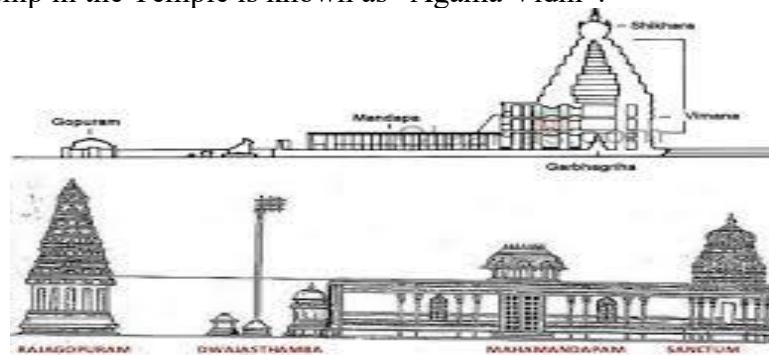
The copper pot signifies the womb; and icon the life arising out of it. The sanctum constructed around it is the body. That pot represents the roots of the “temple-tree”; and the icon its sap. The four walls around the icon represent the branches spreading around. The structure of the Vimana rises above it in a series of tiers. The roof resting over the walls is called Kapotha, meaning where the doves rest. The imagery suggested is that of a tree with birds perched on its branches. The sanctum is thus a model of a growing tree. Another set of symbolism is that the foundation of the temple represents the Earth (prithvi); the walls of the sanctum the water (apaha); and the tower over it the fire (tejas). The final tier of the Vimana is air (vayu) and above it is the form-less space (akash). The sanctum is thus a constellation of five elements that are basic building blocks of all existence. Once the garbadhana and agni-hotra ceremonies are complete the actual construction of the temple commences according to the plan. When the foundation is finished the vertical structure is raised. The external features of the temple are

brought to life through finely sculpted figures and paintings. The art and sculpture frequently portray the forms of divine entities and the different stages of consciousness in the gradual evolution of life throughout the universe. It is believed that the Vastu Purusha sleeps during Bhadrapada, Ashvijya and Karhika months facing east. During Margashira, Pushya and Magha months he sleeps facing south; In phalgun, Chaitra and Vaishaka, he sleeps facing west. And, in Jeysta Ashada and Shravana, he sleeps facing north. The doors facing towards those directions are fixed in the respective months.

Temple Layout and its symbolism **The Agama Shastras say that the Temple structure is a mini cosmos.** The Temple entrance should face east – the direction of the Rising Sun. The ideal Temple should have at least one entrance, an ArdhMandapa, a Mandapa or a large hall, a Garba-Griha and a Shikara directly above the Garbha-Griha. The design comprises:

1. A Towering structure called the Rajagopuram (pyramid in pattern) on the Eastern side at the entrance to the Temple.
2. A Dwajasthamba (pillar) in line with the main shrine immediately after the Rajagopuram.
3. Near the Dwajasthamba is a lotus shaped pedestal for offerings, called the Balipeeta.
4. A large Mandapa or hall for assembly of devotees.
5. The passage through the Mandapa leads to the “Garba-Griha” (womb chamber) where the Main Deity is installed.
6. Ardh Mandapa adjacent to the main Mandapa and before the “Garba-Griha”.
7. The Main Deity faces East word inside and the Garba-Griha is located inside a structure or sanctuary called the “Vimana”.
8. The pyramidal or tapering roof over the Deity is called “Shikara” or “Gopuram” which is a dome.
9. There is a circumnubating passage or “Pradakshira Patha” around the Garba Griha and Mandapa.

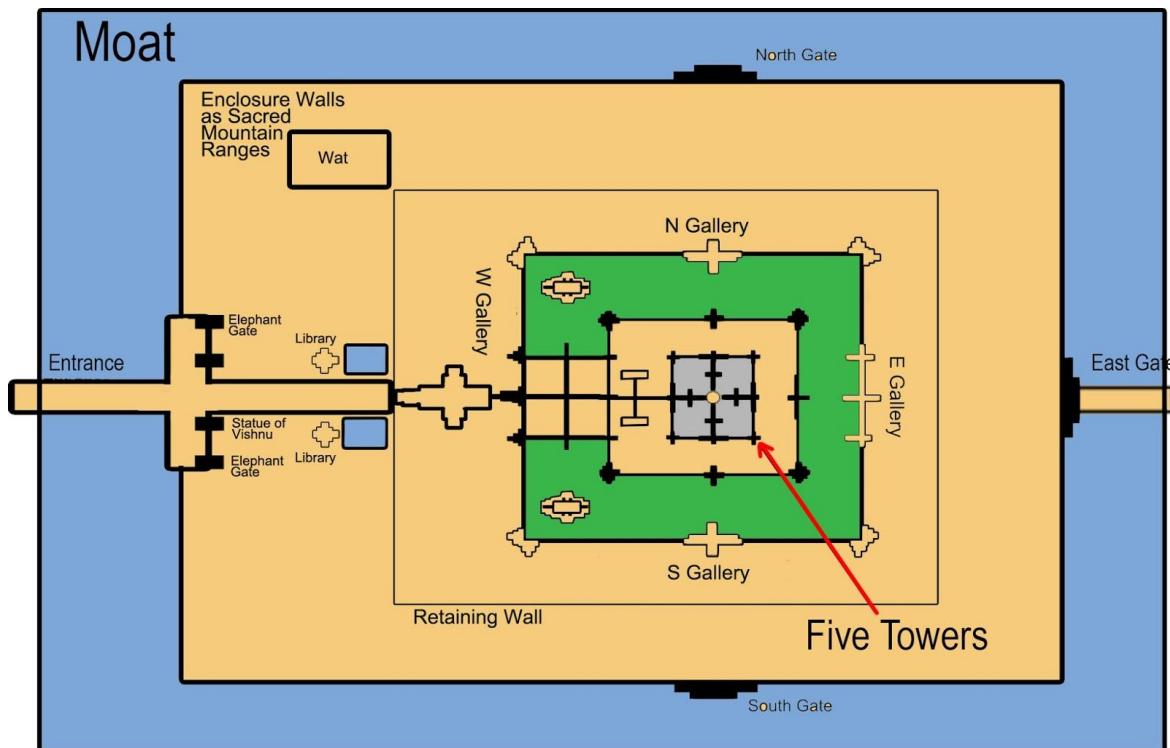
The above design applies both to the “Shiva” and “Vaishnava” Temples with small variations. Architecture is otherwise called “Shilpa” and the one who constructs the Temple is called a “Sthapathi”. The “Sthapathi” is an expert in Temple architecture and idol creation. The procedure of worship in the Temple is known as “Agama Vidhi”.



3. **TEMPLE LAYOUT :** The basic purpose of Hindu temple is to give shelter for a deity and to facilitate its worship by its devotees . The style and Architecture of a Hindu temple is a symbol of Hindu. The Hindu temple is laid out on an east-west alignment; the temple entrance is on the eastern side and the sanctuary is on the western side. The entire temple complex is placed on a high plinth or platform to symbolize its significance. Vaikanasagamas and the silapashastras stipulate the rules for the selection of the site and construction of the temple buildings. Most of the temple adhere to this rule. The Indian

temple architecture also seems to be based on the concept of main shrine as being composed of multiple images of small shrines normally leading up to the building us of towering the super structure. The region wise categories have got the following distinguishing characteristic features. Region Architectural shape Presiding god/deity North India Nagara Square Brahma South India vesara Circular Siva Far south Octagonal Vishnu The temple type that is popular in the Tamil country is the octagonal Dravida-Vimana which is also known as Dravida-Satanga-Vimana. This type consists of six important parts from the base to the final. These six parts are linked to the angas of human beings. There are 1. upapitha, 2. adhisthana, 3. pada or bhiti, 4. prastara, 5. sikhara and 6. griva (Kalasa) humans parts are as follows. Upapitha : Feet Adhisthana : Thigh , up to hip Pada : Forso Prastara : Head Griva(Kalasa) : Neck (top knot) The upapitha and adhisthana constitute the basement. The upapitha is an additional part meant to increase the height of the basement.The pada or bhiti is the wall part of htehouse that houses themulbera. It is fitters with additional architectural moldings such as the kumbha panjara and kostha panjara that add to the aesthetics of the edifice. The kumbhapanjara is of the shape of the full pitheher at its base and is an architectural addition. The kosthapanjara houses Avaranamurts.

4. **WALLED TEMPLE ENCLOSURE** This is a unique feature of the South India temple style. Temples are usually encircled by protective, concentric enclosure walls, with entrances through large gateways (called gopurams) that sometimes even dwarf the enclosed temples. This walled design was perhaps precipitated by the increased fragility of Hindu empires in the wake of ongoing Islamic



Angkor layout

invasions that jeopardized the sacred structures of their civilization. As a result, the temple complex came to include not only the temple, but also the surrounding city itself. Accordingly, the templecities now even more accurately symbolized the divine city surrounded by its mountain ranges (city walls).

PRIMARY STRUCTURES The chief temple structures (moving from east to west) include: Ardha-mandapa. This is a largely open entrance vestibule, entered by passing under a gopuram (arched gateway), symbolic of the passage from the world of the profane to the sacred. Temple-goers ascend stairs, pass under the gopuram to the level of the ardha-mandapa, and then proceed into the mandapa. Mandapa. The mandapa is positioned directly between the entrance vestibule and the garbha griha; it is a columned or hypostyle hall, in which devotees assemble (to view the deity in the garbha griha) and ritual dances are performed. Some more advanced temples will have a second mandapa — called the maha mandapa — that is located in between the external mandapa and the garbha griha. Garbha griha. The square-shaped garbha griha holds the core sanctuary, cella, or Holy of Holies where the resident deity resides. The vimana, the main tower of the temple, sits directly above the garbha griha. The images since the early chola period that decorate the kosthapanjara are the following Ardha-mandapa South Ganapathi Garbhagrha South Dakshinamurti Garbhagraha West Lingodbhavamurth Far south Octagonal Vishnu Vishnu (or) Ardhanarisvara Garbhagraha North Brahma Ardhamandapam north Mahissuramardini In view of the six-fold division of the Hindu temple in its vertical order in comparison with the human angas. It is called parusa. That is to say the temple is equal to that of the cosmic man virat purusa or human form . In its horizontal order of the temple site is divided into a number of squares that is called Vastupurusa. Therefore the Hindu temple is Vastupurusa.

3.THE SQUARE AND CIRCLE: The square sanctuary (garbha griha) is the core of the temple complex, positioned directly under the mountain tower (vimana); it houses the resident deity. The overall plan of the temple is dictated by this central square, as its form is mirrored by surrounding structures. To return briefly to cosmology: The square form is associated in Hinduism with divinity (hence the square sanctuary), whereas the circle is associated with humanity. The transition from profane (circle) to sacred (square) is most profoundly indicated by the half-circle stones positioned at the base of the entrance stairways to temples' ardha-mandapas. It is interesting to note that the apsidal

form used as the floorplan for Buddhist sanctuaries (chaitya) fuses the circular with the square; this was likely the inspiration for the use of these basic, symbolic architectural forms.

4.MOUNT of the God AT THE ENTRANCE The approach to the temple entrance (ardha-mandapa) is indicated by the presence of the resident divinity's mount or transport: Temples venerating Shiva (and his consort, Parvati) display stone images of his mount, Nandi (a seated bull), facing the main shrine. Temples dedicated to Vishnu (and his consort, Lakshmi) display stone images of his mount, Garuda (a mythical bird), facing the main shrine.

There are often three entrances to the South India temple, on the east, north, and south sides of the external ardha-mandapa. This compares versus the Northern temple's single eastern entrance. The progression of rooms follows the same pattern as in the North: the internal mandapa is shown in yellow highlights and the garbha griha sanctuary is shown in red highlights. Vast

hypostyle halls. Later in the Southern style's development, the internal mandapa was replaced by vast hypostyle halls, with as many as one thousand pillars. Later, even the external ardhamandapa was expanded, becoming a small hypostyle hall that fed an even larger one.

5. SOUTHERN STYLE TEMPLE, The Southern style's tower exhibits sharp vertical sides that proceed to the summit in a series of diminishing storey's to form a pyramidal outline (rather than a curved, corn cob like shape). This is perhaps the most easily identifiable feature of the Southern style temple. Further, the clearly visible horizontal lines indicative of the storeys contrast with the Northern style's strong vertical lines. The tower shape was originally inspired by Buddhist vihara monastery antecedents — specifically, the parapets (discussed below) represent the cells around a squareshaped room in which Buddhist monks were allowed to sleep. This core "cell-surrounded square" form is merely superimposed in ever-smaller layers until the desired temple height is achieved.

6. HINDU TEMPLE IN TAMILNADU The Hindu temple in Tamil Nadu was an evolving phenomenon since the pallava to the Vijayanagara Nayaka period. The simple vimana on the Mamallapuram beach(the mukunda Nayanar Temple) has a micro structure which became a macro during the Nayaka period as the temple in Srirangam. Madurai and Tiruvanamalai are the early temples consists of the six vertical parts (Upapitha to kalasa) and the basic plan includes the garbhagraha antarala and Mukhamandapa. From the pallava to Nayaka period a lot of development took place both vertically and horizontally in the format of the Hindu temple building. A number of gopuras, mandapas, subsidiary chapels, tirthas, vahanas and so on were added. The micro gopura that peeps in the kailasanatha temple at Kanchi acquire a pyramidal proportion in the latter temples at Srirangam, Madurai and Tiruvanannamalai .

Gopuras were set in all cardinal directions and at the entry of each prakara, the total number reaching its peak in the Srirangam and Madurai temples. Mandapas of intricate workmanship were in various locations. These catered to the needs of the increasing utsavas; Kalyanamandapa for holding the marriage festival s and Vasantamandapa for holding the spring festival. Subsidiary chapel were added for Devis,Nandi, Garuda, Acaryas and so on. A number of uhanas for processional purpose were added. In short, the Hindu temple reached the optimum level of its evolution under the Nayakas in the Tamil country. Against this background the temple chosen or the present study are examined.

The Temple is not only a home of God but his representation in the structure of temple which resembles human form. The symbolism of the temple plan and elevation suggests that the garbhagrha represents the head and the gopuram the feet of the deity. Other parts of the building complex are identified with other parts of the body. For instance, the sukanasi or ardhamantapa (the small enclosure in front of the garbhagrha) is the nose; the antarala (the passage next to the previous one, leading to passage next to the previous one, leading to the main mantapa called nrttamantapa) is the neck; the various mantapas are the body; the prkaras (surrounding walls) are the hands and so on. Vertically, the garbhagrha represents the neck, the sikhara (superstructure over the garbhagrha) the head, the kalasa (finial) the tuft of hair (sikha) and so on.

Another interesting symbolism is that when a devotee enters the temple, he is virtually entering into a mandala and therefore participating in a power-field. His progress through the pavilions to

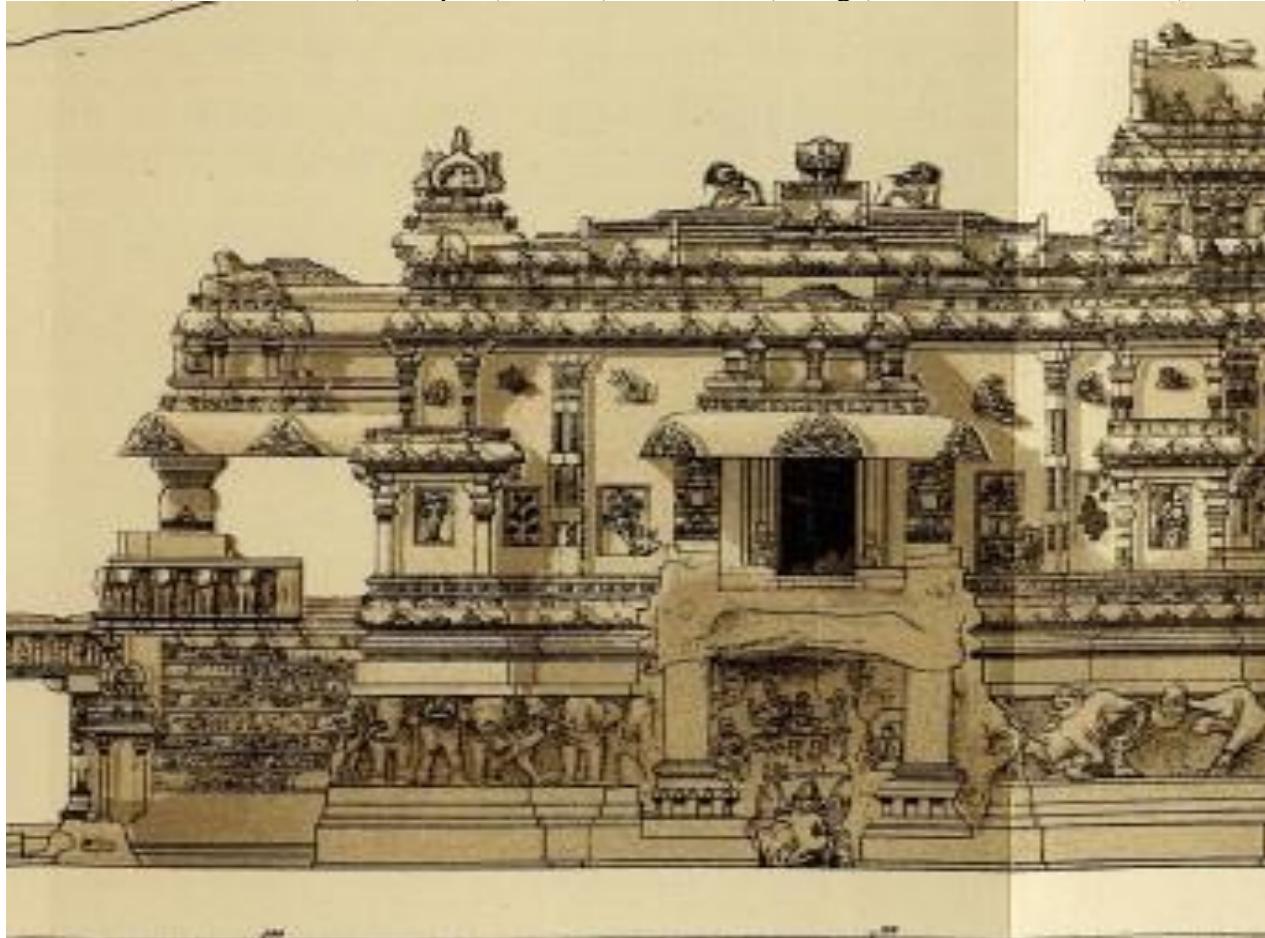
reach the sanctum is also symbolic. It represents the phases of progress in a man's journey towards divine. In accordance with this scheme, the architectural and sculptural details vary from phase to phase ; gradually leading him to the experience, which awaits him as he stands in front of the deity in the in the sanctum. This is explained in the following way. On reaching the main gateway, a worshipper first bends down and touches the threshold before crossing it. This marks the transition from the way of the world to the world of God. Entering the gateway, he is greeted by a host of secular figures on the outer walls; representing the outward and diverse concerns of man. As he proceeds, the familiar mythological themes, carved on the inner walls attune his attitude. The immediate pavilion and vestibule near the sanctum are restrained in sculptural details and decorations; these simpler motifs and the prevailing semi darkness help the worshipper to put aside distractions and try focusing his attention on the sanctum. Finally the shrine, devoid of any ornamentation, and with its plainly adorned entrance, leads the devotee further to tranquility, to fulfilment and to the presence of God. The garbhagriha is usually surrounded by a circumambulatory path, around which the devotee walks in a clockwise direction. In Hindu and Buddhist thought, this represents an encircling of the universe itself. Positions and orientations of the temples. The following plan indicates the position of gods and goddesses in an 81 celled temple-site. This plan relates to construction of a Vishnu temple.

CENTRAL PART: Atri Samhita (2.38.42) prescribes that the central Brahma bagha must be divided into four equal parts and the main shrine facing east must be located on the North-western side thereof. The shrine must have five sanctums, to house five forms of Vishnu; and the shrine should have three stories. The icon of Vishnu , the principal object of worship, may be represented in the shrine in one of his many forms . It could be single (eka-murti-vidana) or many (aneka-murti-vidana). The aneka forms might be : 5 (pancha murti); 6 (shan murti); or 9 (nava murti). The opening of the sanctum on the Eastern side is preferred , specially in a shrine dedicated to Vishnu. The shrine must never have a door in the intermediate direction (Vidik)- Atri Samhita (2.3233) And, generally, the doorway to the East is the best , most auspicious (uttamottamam) ;to the West is next best (uttama); to the South is middling (madhyama); and, to the North is not desirable (adhama) – Vimanaarchana kalpa (patala 3)

Building layout design is regarded as one of the major tasks in architecture design. It determines the shapes, dimensions, and positions of internal building spaces to satisfy architectural criteria. This task becomes complicated for human designers when the topology relationships of rooms are complex.

The sanskrit mantras chanted by the priest are as important as the actual mandala. The mantra infuses the mandala with spiritual powers. The mantras are the subtle form of the mandala and therefore the two are inseparable. In the unit of Brahma, Ananta, a golden serpent with many raised hoods is placed. It is then surrounded with nine precious jewels or navaratna. Ananta represents the energy of God in which the universe rests in space. The nine jewels invoke the astrological influence of the nine planets and are composed of a diamond, emerald, ruby, pearl, yellow sapphire, blue sapphire, red coral, cats-eye and jade. A gold lid with the seven continents of the earth engraved on it is placed on top of the box following which the agni-hotra, or sanctification ceremony. During the agni-hotra the priest offers clarified butter, the symbol of religious principles, into the fire, which represents the mouth of the Cosmic Being. Along with the offering of clarified butter five types of grains-rice, wheat, barley, rye and dhal, are also offered with the chanting of mantras. Temple Layout Ancient Scripts on Temple Construction in

Hindu Shastras: The Shilpa text Shiva-prakasha in its chapter titled vastu-bhumi-bedha, describes sixteen (Shodasha) types of temple layouts: 1. Square (Chandura); 2. Rectangle (Agatra); 3. Trapezium (with uneven sides – like a cart – shakata); 4. Circle (Vritta); 5. Elliptical (kritta vritta); 6. triangular (dwaja); 7. diamond or rhombus (vajra); 8. Arrow (shara); umbrella (chatra); 9. fish (meena); 10. back of a tortoise (kurma); 11. conch (shanka); 12. crescent (ardha-chandra); 13. pot (kumbha); 14. sword (khadga); 15. and lotus (kamala).



South elevation plan of Kailash temple is Plate LXXXII from the book “Cave temples of India” by Ferguson, James and James Burgess

These layouts have specific applications; and are not to be used generally. For instance: the back of a tortoise (kurma), pot (kumbha), conch (shanka) and lotus (kamala) are recommended only for Vishnu and Shiva temples. Similarly the Square (Chandura), Rectangle (Agatra), fish (meena), diamond or rhombus (vajra) and sword (khadga) are recommended for Devi temples. The rest of the lay outs are for other (lesser) deities. But all texts generally agree that the square or the rectangular shape of layout are the best and most auspicious. Varaha-samhita calls such layouts as Siddha-bhumi, the best of all. In case the layout is rectangular, the North South dimension should be greater than East-west dimension. It is also said, it would be better if the elevation on the west or the South is slightly higher.

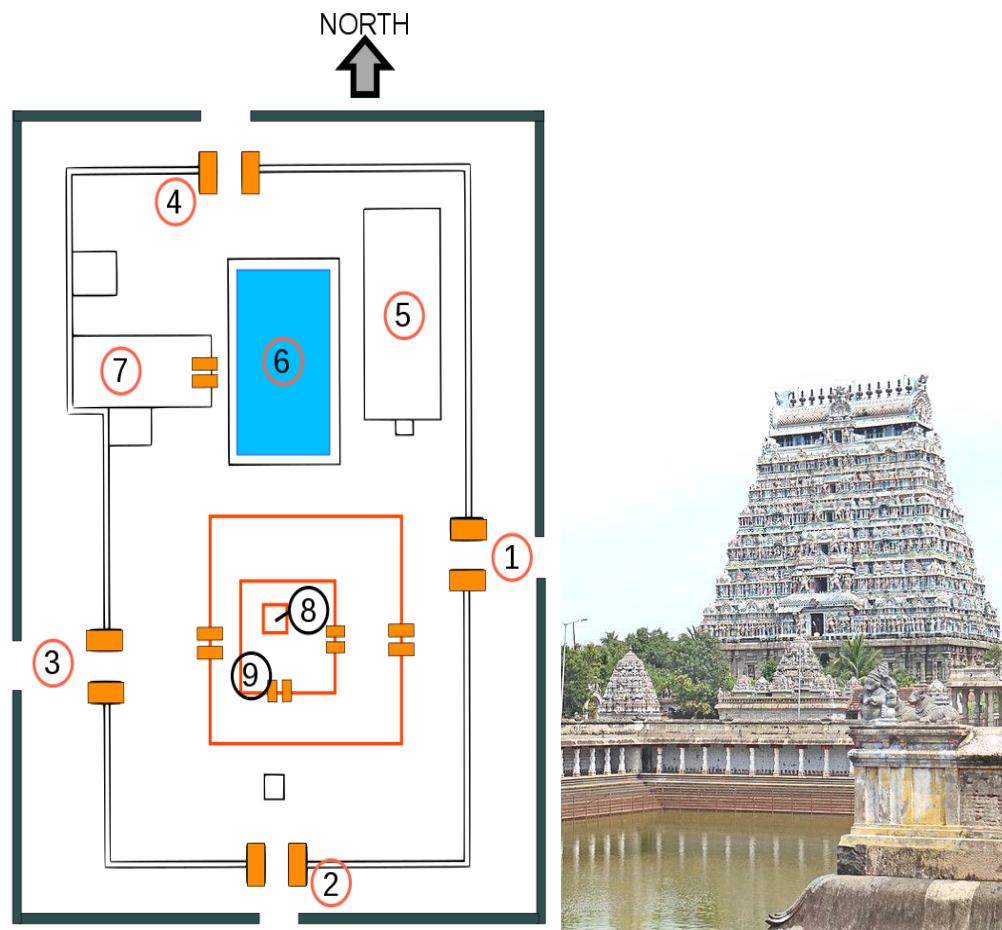
STONE STRUCTURES

Though there are hardly any remains of stone Hindu temples before the Gupta dynasty in the 5th century CE, there probably were earlier structures in timber-based architecture. The rock-cut Udayagiri Caves (401 CE) are among the most important early sites, built with royal sponsorship, recorded by inscriptions, and with impressive sculpture. The earliest preserved Hindu temples are simple cell-like stone temples, some rock-cut and others structural, as at Temple 17 at Sanchi. By the 6th or 7th century, these evolved into high shikhara stone superstructures. However, there is inscriptional evidence such as the ancient Gangadhara inscription from about 424, states Meister, that towering temples existed before this time and these were possibly made from more perishable material. These temples have not survived.

No pre-7th century CE South Indian free-standing stone temples have survived. Examples of early major South Indian temples that have survived, some in ruins, include the diverse styles at Mahabalipuram, from the 7th and 8th centuries. According to Meister, the Mahabalipuram temples are "monolithic models of a variety of formal structures all of which already can be said to typify a developed "Dravida" (South Indian) order". They suggest a tradition and a knowledge base existed in South India by the time of the early Chalukya and Pallava era when these were built. In the Deccan, Cave 3 of the Badami cave temples was cut out in 578 CE, and Cave 1 is probably slightly earlier. Other examples are found in Aihole and Pattadakal.

Medieval Period (7th to 16th century)

about the 7th century most main features of the Hindu temple were established along with theoretical texts on temple architecture and building methods. From between about the 7th and 13th centuries a large number of temples and their ruins have survived (though far fewer than once existed). Many regional styles developed, very often following political divisions, as large temples were typically built with royal patronage. The Vesara style originated in the region between the Krishna and Tungabhadra rivers that is contemporary north Karnataka. According to some art historians, the roots of Vesara style can be traced to the Chalukyas of Badami (500-753AD) whose Early Chalukya or Badami Chalukya architecture built temples in a style that mixed some features of the *nagara* and the *dravida* styles, for example using both the northern shikhara and southern vimana type of superstructure over the sanctum in different temples of similar date, as at Pattadakal.



Nataraja temple plan. 1: East gopura; 2: South gopura; 3: West gopura; 4: North gopura; 5: 1000 pillar hall (choultry); 6: Shivaganga pool; 7: Devi temple; 8: Shiva Sanctum + Chit Sabha + Kanaka Sabha; 9: Vishnu shrine.

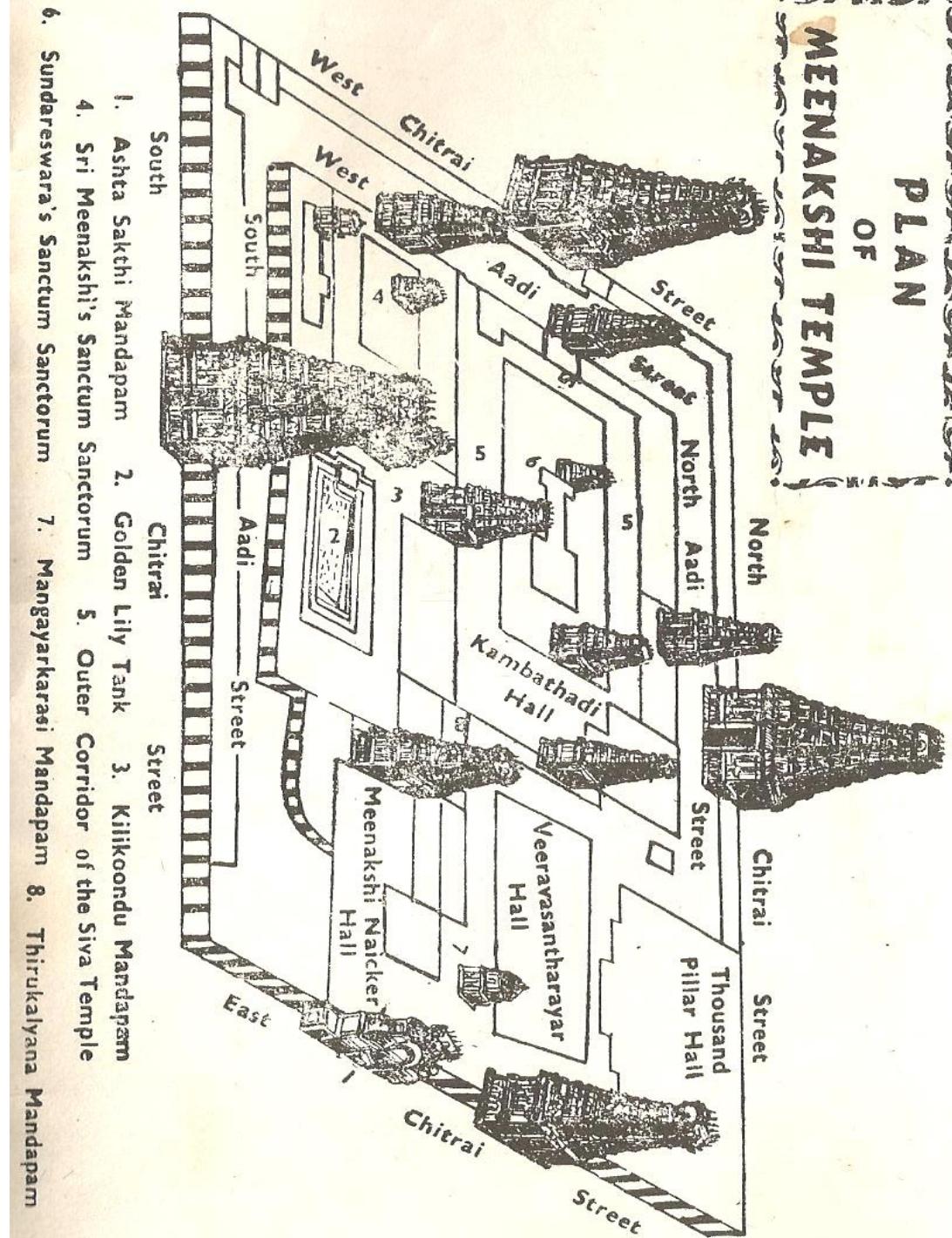


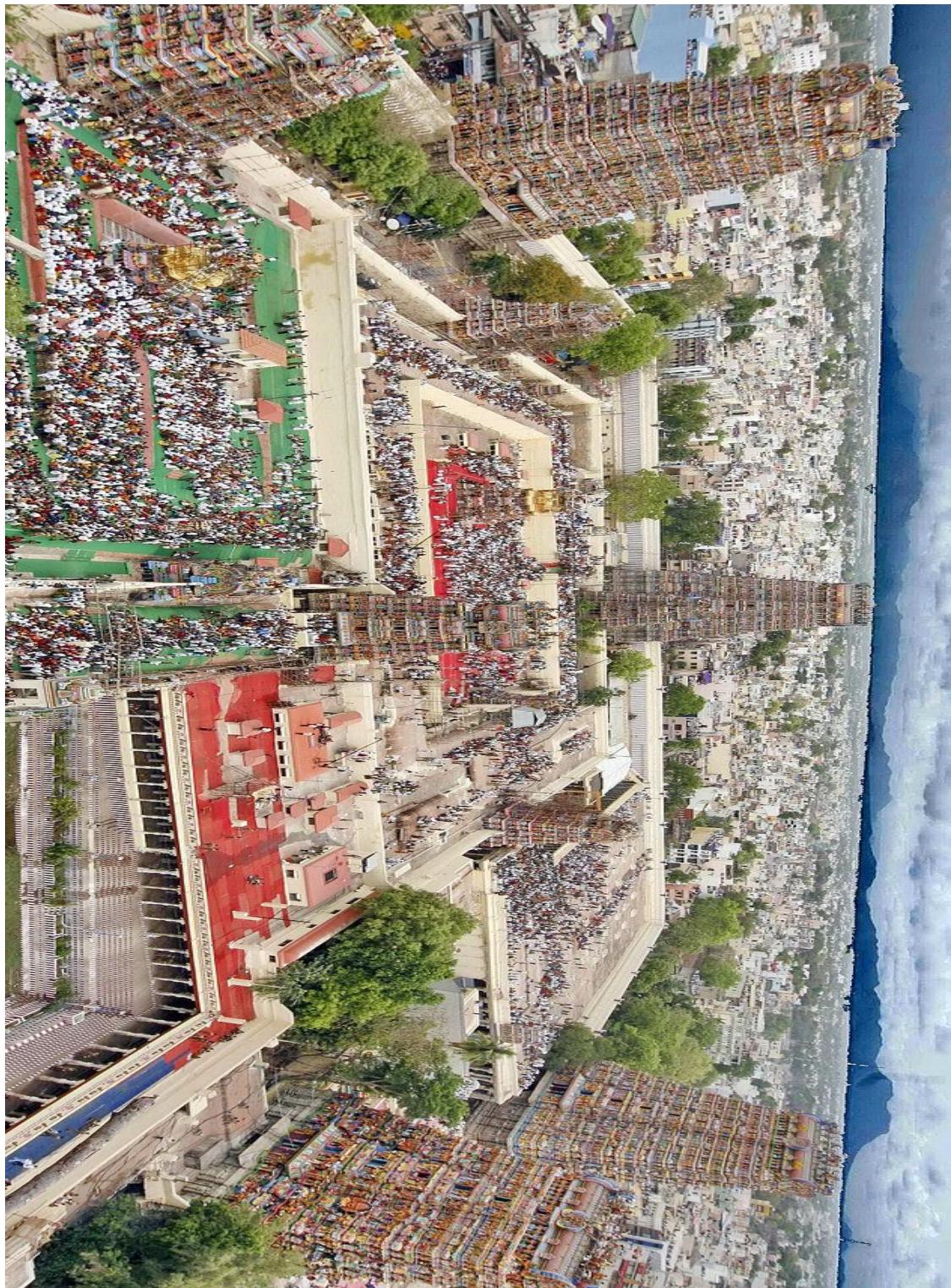
Earliest examples of Pallava architecture are rock-cut temples dating from 610 to 690 CE and structural temples between 690 and 900 CE. The greatest accomplishments of the Pallava architecture are the rock-cut Group of Monuments at Mahabalipuram at Mahabalipuram.

Western Chalukya architecture linked between the Badami Chalukya Architecture of the 8th century and the Hoysala architecture popularised in the 13th century. The art of Western Chalukyas is sometimes called the "Gadag style" after the number of ornate temples they built in the Tungabhadra – Krishna River doab region of present-day Gadag district in Karnataka. Their temple building reached its maturity and culmination in the 12th century, with over a hundred temples built across the deccan, more than half of them in present-day Karnataka. Apart from temples they are also well known for ornate stepped wells (*Pushkarni*) which served as ritual bathing places, many of which are well preserved in Lakkundi. Their stepped well designs were later incorporated by the Hoysalas and the Vijayanagara empire in the coming centuries.

In the north, Muslim invasions from the 11th century onwards reduced the building of temples, and saw the loss of many existing ones. The south also witnessed Hindu-Muslim conflict that affected the temples, but the region was relatively less affected than the north. In late 14th century, the Hindu Vijayanagara Empire came to power and controlled much of South India. During this period, the distinctive very tall gopuram gatehouse, (actually a late development, from the 12th century or later), was typically added to older large temples.

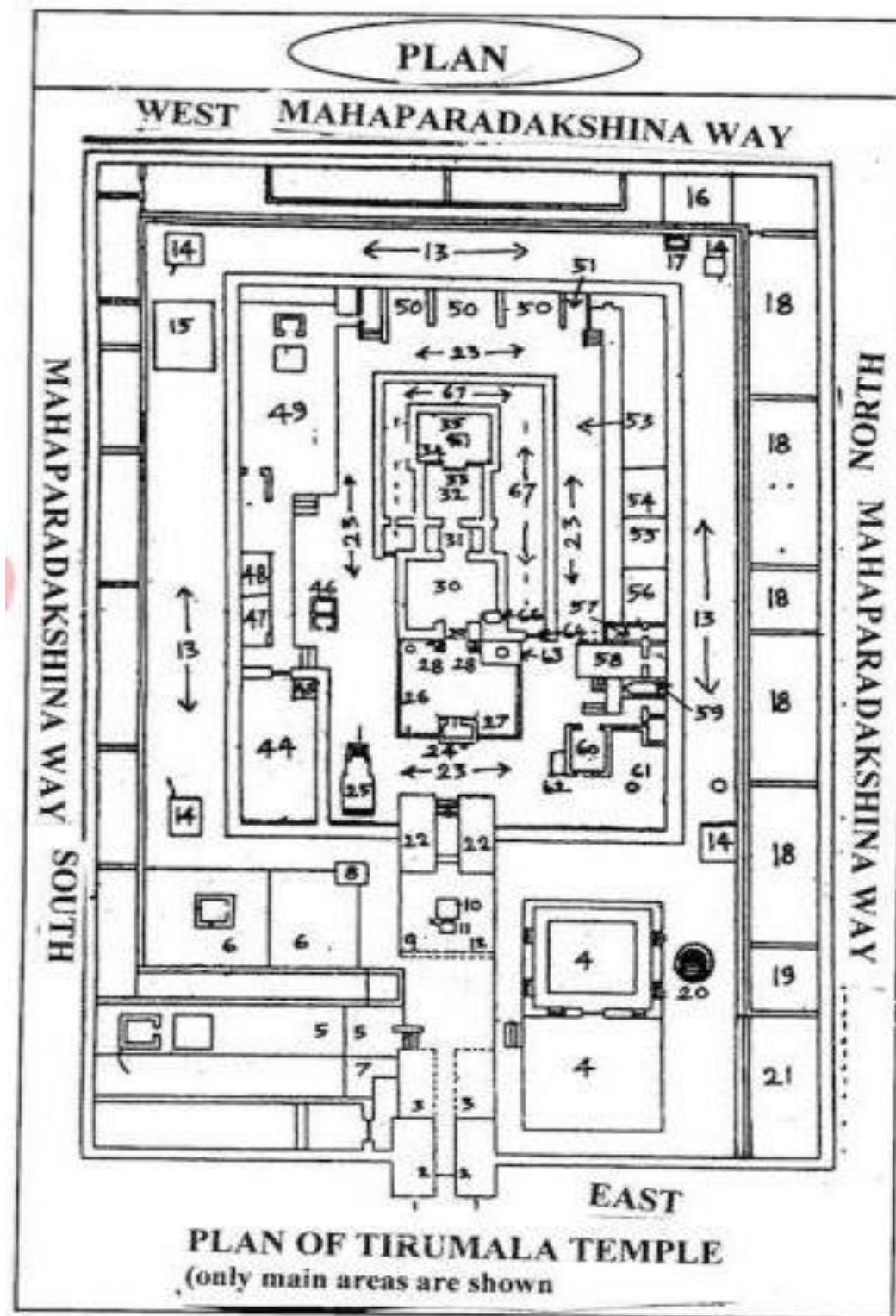
**PLAN
OF
MEENAKSHI TEMPLE**





The Meenakshi temple complex of Madurai, mostly built between 1623 and 1655 CE, a large complex in the Dravidian architecture of South India, dominated by gopuram gatehouse towers. 2 main shrines are much smaller, with gold tops.

TIRUPATI TEMPLE



- 1.MAHADWARA GOPURAM
- 2.SHANKHANIDHI - PADMANIDHI
- 3.KRISHNADEVARAYALA MANDAPAM
- 4.ADDALA MANDAPAM
- 5.RANGANAYAKA MANDAPAM
- 6.TIRUMALARAYA MANDAPAM
- 7.TULADANDAM
- 8.RAJA THODARAMALLU
- 9.DWAJASTHAMBHA MANDAPAM
- 10.DWAJASTHAMBAM (FLAGSTAFF)
- 11.BALI PEETAM (ALTAR)
- 12.KSHETRA PALAKA SILA (BIG ROUND STONE)
- 13.SAMPANGI PRADAKSHINAM
- 14.FOUR PILLAR MANDAPAM
- 15.SRI VENKATA RAMANA SWAMI'S KALYANA MANDAPAM
- 16.UGRANAM (STONE HOUSE)

The Hindu Imprint



Did you know that Angkor Wat, the intriguing temple complex of Cambodia was inspired by Mahabalipuram sculptures? Some call these places Vaikuntha, an abode of the preserver of the universe. When you look at the sculptures of Angkor Wat and the ancient temples of Mahabalipuram, you'll find a number of similarities, sounds interesting right?



South-East Asian Hindu temples



Prambanan in Java, Indonesia (9th century) and Angkor Wat in Cambodia (12th century), examples of Southeast Asian Hindu temple architecture. Both temples were modelled after Mount Meru in Hindu cosmology.

India-Cambodia cultural and historical relations are more than a millennium old when Indian culture, religion and trade emanated out of India and spread rapidly in various parts of South-East Asia. However, Cambodia witnessed Indian influence centuries before that whose living example is the temples of Sambor Prei Kuk built by Ishanvarman I and other kings of Chenla empire during 6th and 7th Century AD in Ishanapura, the then capital of the Kingdom, which is so far the oldest known example of existence of Indian culture and religion in Cambodia. However, some scholars are of the opinion that the cultural and religious connect between India and Cambodia date back to 1st century. According to Cambodian belief, Khmer people's founding legend centers around an Indian prince Kaundinya called Preah Thaong in Cambodian folklore. Cambodian society which is now predominantly Buddhist retains a strong influence of Indian Hindu and Buddhist rituals, idolatry and mythology which can be seen in many of its rituals having resemblance with Indian culture and traditions. Khmer language too is a live example of Indian culture which has approximately more than 3000 words originated from ancient Indian Sanskrit language. Later the pervading influence of Hinduism, Buddhism, and Indian architecture are borne out by the magnificent structures at Angkor Wat, Angkor Thom, Bayon, Ta Prohm, Banteay Srei, Preah Vihear and other religious and historical sites in Cambodia.

Early Hinduism in SE Asia was largely focused on devotion to Lord Vishnu. Literally hundreds of Vaishnav images have been in the Mekong Delta, in both Cambodia and Vietnam, many dating from the 5th, 6th & 7thC CE.

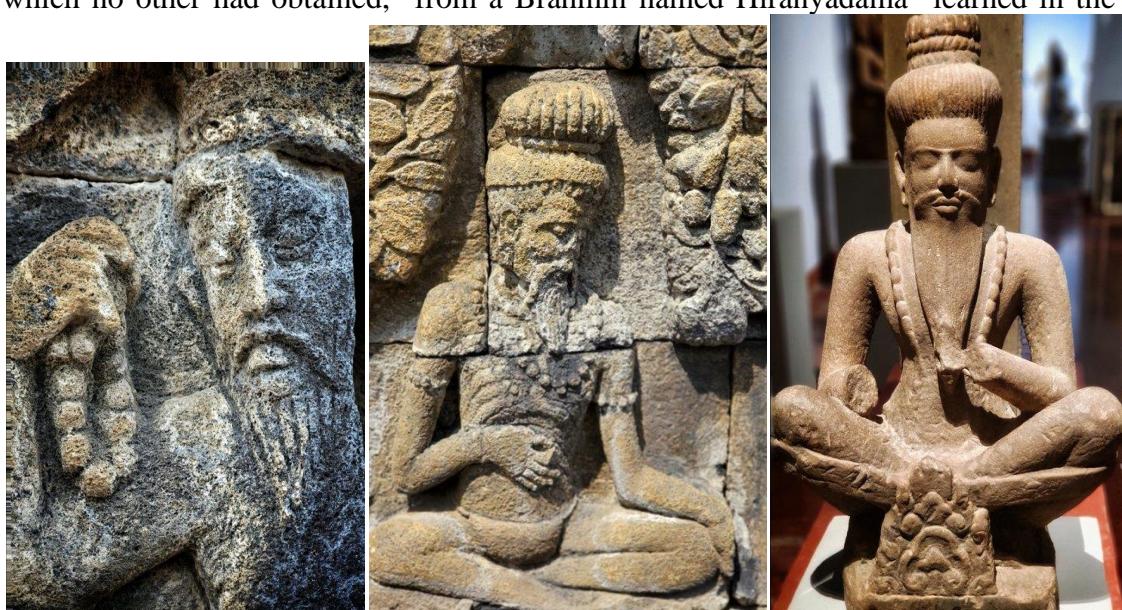


Many of the earliest images of Mitred Vishnu's have been dug up around the early trading sites of Oc Eo, Angkor Borei & Phnom Da where ships brought in goods from across the Bay of Bengal to Suvarnabhumi, the Lands of Gold. <https://twitter.com/DalrympleWill/status/1484091464846299137>

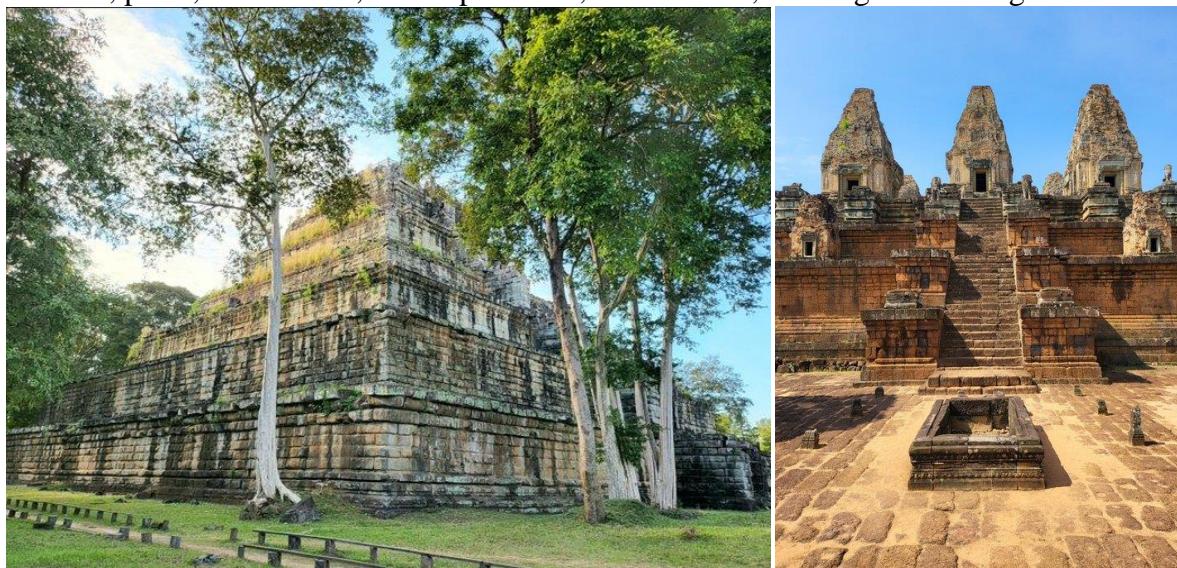
Then in the fifth century, a wave of Shaivite Pasupatas arrived in some numbers in SE Asia from India, spearheading a new wave of popularity in Shaivism which up to then had been much less prominent than devotion to Lord Vishnu. The Pasupatas were wandering ascetic Brahmins who smeared their bodies with a "white radiance" of the dust from cremation grounds. They bathed themselves in ashes three times a day and slept on a bed of ashes. The Pasupatas turned their back on the conventions of society. Some pretended to be madmen, making obscene gestures, singing, dancing and laughing. They lived between two worlds, and through their austerities and visions believed they could cross over to the world beyond.

Orthodox Indian Brahmins, versed in the Vedas, fire sacrifices & the Dharmashastras had been coming to the region for centuries, offering to empower local kings with ritual consecration & astrological predictions, as well as more terrestrial skills such as literacy & numeracy. In 984 one Chinese source mentioned the existence of more than a thousand Indian Brahmins at one Khmer court. Many were reported to have married Khmer princesses in return for their services. But the Pasupatas offered more: Siddhis- secret spiritual knowledge- and yogic powers ranging from concentration and "unshakable self control as a result of austerities" to magical powers- ways to shrink or enlarge the body, to fly & to hear conversations held far away.

In order to obtain victory over his enemies, Jayavarman II for example was offered "a Siddhi which no other had obtained," from a Brahmin named Hiranyadama "learned in the mantras."



They preached a particularly intense devotion to Lord Shiva as the Supreme Yogi, the ultimate form of cosmic protection and the protector of kings. The pyramid temples built by Khmer rulers at the centre of their domains are almost all dedicated to the worship of Lord Shiva, such as this massive edifice at Koh Ker (Angkor Wat is the great exception: it was originally dedicated to Lord Vishnu.) The lingams placed in these sanctuaries are often named after the venerable Shaivite pilgrimage sites of India- for example the Rajendrabhadresvara lingam of the Pre Rup temple pyramid, is named after the 10thC ruler who erected it Rajendravarman + Bhadresvara. The new Shaivite arrivals made a dramatic impression on their hosts and soon came to power as advisors, poets, bureaucrats, ritual specialists, astronomers, astrologers and magicians.





For some **600 years**, from the 8th to 13th centuries, the **Khmer empire** ruled much of mainland Southeast Asia from its capital of Angkor in northern Cambodia. Here the Khmer people erected major temples, and their rulers were considered god-kings, associated with Shiva, Vishnu, or other Hindu deities. Jayavarman II is generally considered the founder of the Khmer empire. Around 800 he established his royal court, where he stressed both his role as a god-king and parallels between the temples he built and the gods' abode of Mount Meru. He regarded Shiva as his personal deity and established a cult of the royal *linga*.

The next few centuries saw Angkor become a great city with elaborate temples. Some kings, like Suryavarman I, patronized both Hinduism and Buddhism, although the Khmer kings remained predominantly Hindu. Great monuments like the Baphuon (11th century) and Angkor Wat (12th century), with their supremely rhythmic and elegant relief sculptures on themes from the Hindu epics as well as scenes from daily and ceremonial life including military processions and dance, mark a high point in Cambodian art.

The level of detail visitors to Angkor Wat are struck by its imposing grandeur and, at close quarters, its fascinating decorative flourishes. Stretching around the outside of the central temple complex is an 800m long series of intricate and astonishing bas-reliefs – carvings depicting historical events and stories from Hindu mythology.

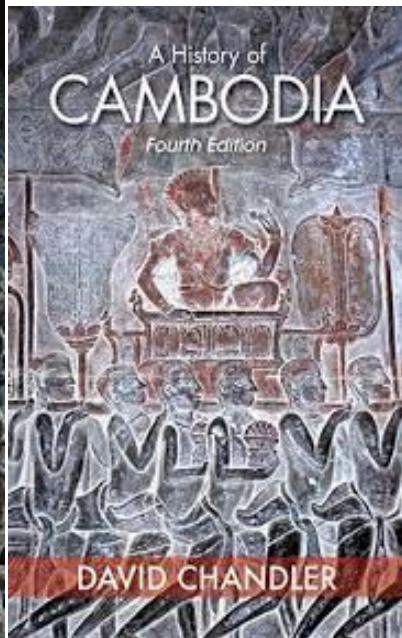
Shaivite Cambodia

Like with all things medieval, it turns out that the truth is far stranger than modern notions. It is certainly beyond dispute that for many centuries — starting from around the 8th century CE all the way up to the 15th — the religious culture of Cambodia was predominantly Shaivite. But the process by which it *became* Shaivite is astonishing: Contrary to what we may think, it involves active conversion by Hindu preachers, market forces emerging from Cambodian courts, Indians

emigrating in search of greener pastures, and a considerable degree of intelligence and selectivity in how Cambodia interacted with ‘Indian’ ideas.

The sect known as the Pashupatas and its missionaries in India and abroad

Roughly around the second century CE, legend holds that the corpse of a young man in Karohana (present-day Karvan), Gujarat, was reanimated. This man, Lakulisha, then went about preaching a Shaiva doctrine revolving around asceticism and meditative practice to inculcate magical powers. And thus, the sect known as the Pashupatas was born. It would grow to become one of the most influential and widespread sects of all early medieval schools of Shaivism. From the outset, Pashupatas distinguished themselves from other Shaivite sects by their missionary zeal. Lakulisha himself travelled to distant Mathura and initiated four Brahmin disciples into his esoteric tradition, positioning each of them in a different city to convert many more. Pashupatas spread rapidly through the relatively urban Gangetic Plains; within barely a few generations (fourth century CE), they were being mentioned in the inscriptions of the Gupta emperors, and were spreading down the coast towards the Krishna-Godavari delta. By the seventh century, they had established themselves near the now-famous Pashupatinath Temple in Kathmandu, Nepal. Chinese travellers claim that by this time, Varanasi alone had nearly 10,000 of these ash-covered ascetics, and here, they composed much of the great text known as the *Skanda Purana*. Around this time, they also began seeking a foothold in new, rapidly-urbanising regions that were developing complex state structures, the elites of which required ritual services and were willing to pay dearly for them. We thus begin to see them in the inland Deccan and in Southeast Asia.



Lakulisha at Sangameshvara Temple at Mahakuta, Karnataka (Chalukya, 7th century CE). His 5th–10th century ithyphallic statues are also found in seated yogi position in Rajasthan, Uttar Pradesh in India and elsewhere

A Deccan inscription from 660 CE offers some insight into this process. In return for ritually initiating the Chalukya king Vikramaditya I into Shaivism, the Pashupata guru Sudarshana was granted the village of Iparumkal. Sudarshana then distributed plots in the village to 27 Shaivite Brahmins; over the generations, through close ties with the Chalukyas, this region, present-day Alampur, Telangana, grew into a major Shaiva stronghold.

Religious Reform in Cambodia

It is in this context that we now turn to Cambodia. Around this time, Cambodia, like the Deccan, was home to several warring principalities. The general region — including sites in Laos — already had some centres of Shiva worship, particularly centred around mountains and natural stone columns believed to be self-manifestations (*svayambhu*) of the Shiva linga. In Cambodia, stones were already believed to be the dwellings of ancestral spirits associated with the land; it seems to have been a natural transition to see stone Shiva linga as representing a primordial, ancestral deity of the land as well. Pashupatas may have arrived on these shores as early as the fifth century, with the earliest epigraphic evidence dating to the seventh century.

The Cambodian embrace of Pashupata missionaries was also tied also to their beliefs about rulership. David Chandler in his *History of Cambodia* says that those who could lead men and win battles were also believed to be spiritually gifted, and vice versa. This idea that worked well with Pashupata concepts of gaining magical power through Shaivite ritual. Cambodian chiefs, seeking to attract and use Pashupata ritual knowledge, rapidly commissioned dozens of Shaivite temples along the length of the Mekong River and in various urban, political, and pre-existing sacred centres. Many of these were named after existing Pashupata Shiva centres in India (Siddheshvara, Amratakesvara, Amareshvara), writes Shaivism scholar Alexis Sanderson in *The Saiva Religion Among the Khmers*. The objective behind these constructions was not an ‘imitation’ of India, but to make Shiva a Cambodian god and Cambodia a Shaivite land, as was being done by temple-building royals in South India at the same time.

Market forces and Shaivite ritual

Through the sixth to the ninth centuries CE, as Cambodian princes and Pashupata initiates were making their land increasingly Shaivite, Indian Shaivism underwent a major transition with the growth of *mantramarga*, Shaiva Siddhanta, or tantric Shaivism. *Mantramarga* texts were somewhat simpler than the esoteric doctrines of the Pashupatas, providing *agamas* — scriptures and frameworks of practice — that could be developed by practitioners for use in temples, personal worship, and public rituals.

The arrival of *mantramarga* texts in Cambodia was revolutionary. In 802 CE, when the young king Jayavarman set out to establish the empire of Angkor, he conducted a ritual with a Brahmin priest, Hiranyadama. The priest developed a *paddhati*, a detailed ritual manual that was the basis of the Devaraja cult, practically the State religion of the Angkor Empire for centuries after. The Devaraja cult closely associated the king with Shiva, and worshipped him as the king of the gods. It led to the establishment of dozens of temples and monastic establishments, all of which drew on *paddhatis* composed by *mantramarga* experts.

So, what can we really say about medieval Cambodia’s relationship with India? If

These texts reveal something fascinating about medieval Shaivism. *Mantramarga* practitioners were technically supposed to base their *paddhatis* on *agamas* of their own school and lineage. In practice, due to the need to fulfil the ritual demands of their royal customers, they very often melded together multiple lineages in their *paddhatis*. The Cambodian market for Shaivite experts was such that many Indians are known to have travelled there in search of employment, especially Brahmins. Some of them even claimed to have come to worship the national god, Shiva Bhadreshvara. (Oddly, we have little evidence that Southeast Asians ever visited Hindu sacred sites in India, but plenty of evidence of the converse).

Anirudh Kanisetti is a public historian. <https://theprint.in/opinion/indias-hindu-preachers-how-shaiva-monks-converted-cambodia/1097764/>

Possibly the oldest Hindu temples in South East Asia dates back to 2nd century BCE from the Funan site of Oc Eo in the Mekong Delta. They were probably dedicated to a sun god, Shiva and Vishnu. The temple were constructed using granite blocks and bricks, one with a small stepped pond.

The earliest evidence trace to Sanskrit stone inscriptions found on the islands and the mainland Southeast Asia is the Võ Cạnh inscription of Champa dated to 2nd or 3rd century CE in Vietnam or in Cambodia between 4th and 5th-century CE. Prior to the 14th-century local versions of Hindu temples were built in Myanmar, Malaysia, Indonesia, Thailand, Cambodia, Laos and Vietnam. These developed several national traditions, and often mixed Hinduism and Buddhism. Theravada Buddhism prevailed in many parts of the South-East Asia, except Malaysia and Indonesia where Islam displaced them both.

Hindu temples in South-East Asia developed their own distinct versions, mostly based on Indian architectural models, both North Indian and South Indian styles. However, the Southeast Asian temple architecture styles are different and there is no known single temple in India that can be the source of the Southeast Asian temples. According to Michell, it is as if the Southeast Asian architects learned from "the theoretical prescriptions about temple building" from Indian texts, but never saw one. They reassembled the elements with their own creative interpretations. The Hindu temples found in Southeast Asia are more conservative and far more strongly link the Mount Meru-related cosmological elements of Indian thought than the Hindu temples found in the subcontinent. Additionally, unlike the Indian temples, the sacred architecture in Southeast Asia associated the ruler (devaraja) with the divine, with the temple serving as a memorial to the king as much as being house of gods Notable examples of Southeast Asian Hindu temple architecture are the Shivaist Prambanan Trimurti temple compound in Java, Indonesia (9th century), and the Vishnuite Angkor Wat in Cambodia (12th century).

Chapter 5

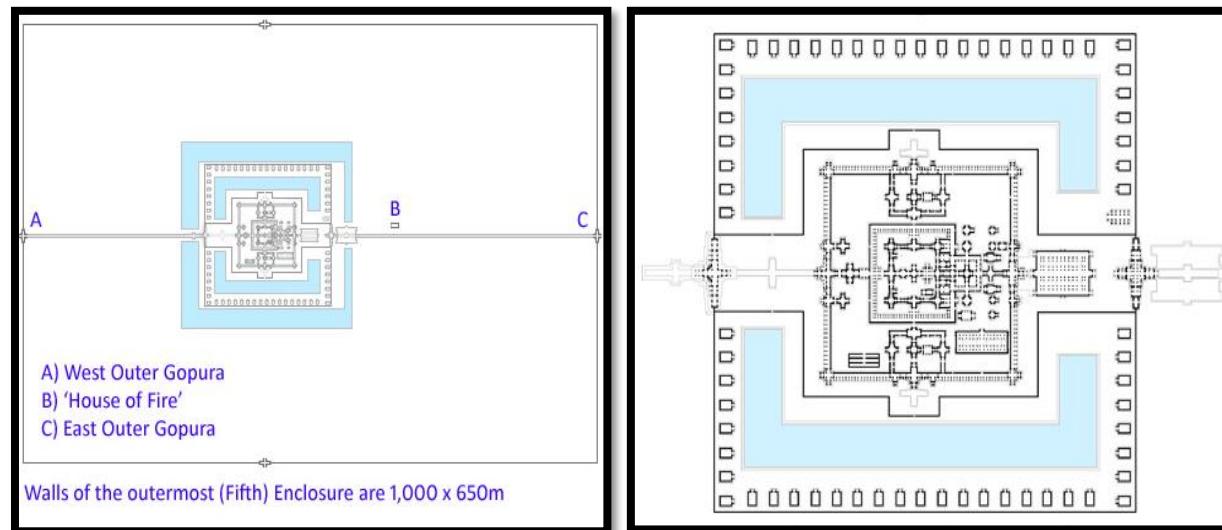
Layouts of the Mandirs (Temple) of the Khmer Kings

Simple example of the Ta Prohm Temple (c. 1186) A mighty temple that archaeologists have allowed nature to recover. It was built during the reign of Jayavarman VII, a great king who reconquered the Khmer empire from Cham invaders in the years 1177-1181. Needless to say, the war caused great damage to the ancient capital of Angkor. The ambitious king set about making it into a proper seat of power by ordering the reconstruction of a number of temples.

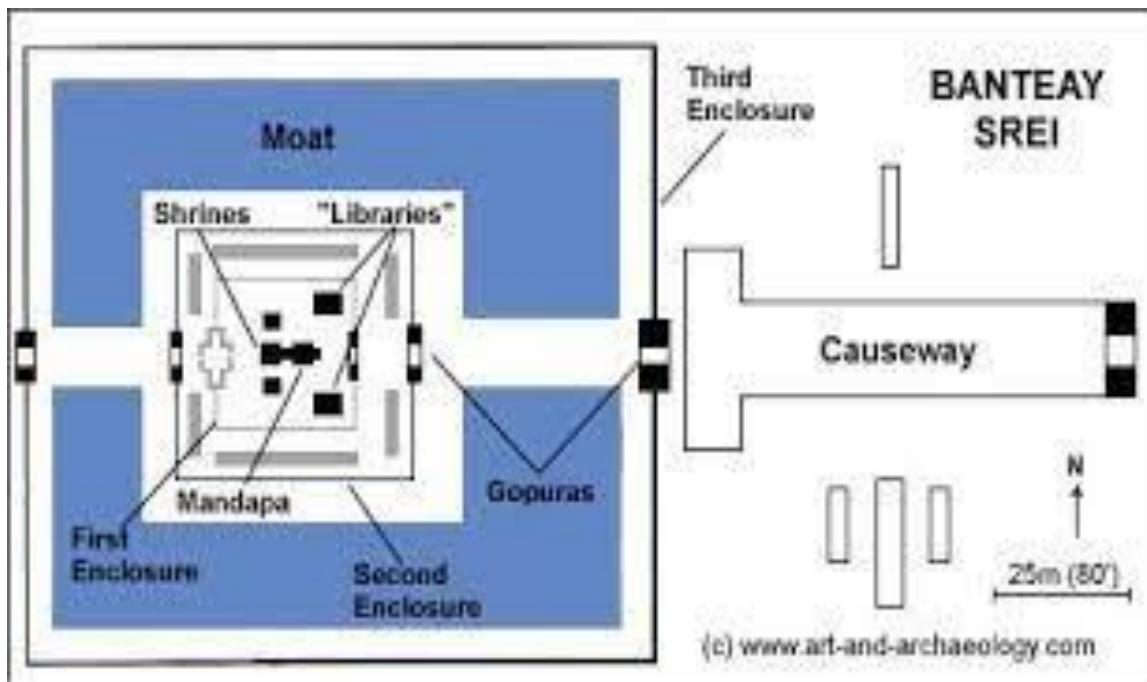
Ta Prohm was the centerpiece of his master plan, located roughly in the center of the capital. Though the temple covers barely 2.5 acres, its walls and moat encompass 148 acres, which would have sheltered a town attached to the temple. According to a stele found here on site, 12,640 people lived at the temple, supported by a population of 79,365 who worked in nearby villages to provide food and supplies. In its own era, the temple was known as Rajavihara, the 'Royal Monastery'.

Ta Prohm housed the deity Prajnaparamita, the 'perfection of wisdom.' It was consecrated in 1186. Like many Khmer kings, Jayavarman had it carved in the likeness of his mother. The Prajnaparamita statue was surrounded by 260 lesser divinities, housed in their own sanctuaries.

Interestingly, the temple was also the headquarters of a vast hospital network created by the king. From Ta Prohm, supplies filtered out to 102 hospitals located throughout the empire. The Khmer kings seem to have taken the Buddha's call to mercy into their own hands.



Bantey Srei



The Ambitious construction project of the temple of Tribhuvanamahesvara.

Banteay Srei or **Banteay Srey** is a 10th-century Cambodian temple dedicated to the Hindu god Shiva. Also known as the "Citadel of Women", it was discovered by the French Geographical Service in 1914, in the forest near Mt Kulen about 25 km north of Angkor proper. It was built by Yajnavaraha a counsellor (guru) of King Rajendravarman 11. Rajendravarman 11 ruled from 944-968 CE. He moved the capital back to the Angkor region and restored Khmer power across the region by successfully raiding neighbouring regions in Vietnam and Thailand. The temple was associated with small town of Isavarapura. It was cleared in 1924 by Parmentier and published by Goloube in 1925. It is notable because it was fully restored using anastylosis from 1931-36 by Marchal. It was the first temple at Angkor to receive this treatment. The central foundation stele, discovered in 1936, allows the temple to be dated. The inscription gives a date of April-May 967, the last year of Rajendravarman 11's reign. The mention of a linga of Shiva in the central sanctuary gives us its official name: Great Lord of the Three-fold World, Tribhuvanamahesvara.

This famous Khmer temple of Yajñavarāha, a Brāhmaṇa priest, who served during the reigns of Khmer kings Rajendravarman and Jayavarman V. According to stele inscription of Banteay Srei, work on its construction began in 967 CE and Yajñavarāha's brother, Viṣṇukumāra, is also mentioned as a co-patron. Banteay Srei was the only major temple at Angkor not built for the king. This temple lies near the hill of Phnom Dei located twenty-five km to the northeast of the main group of temples, where Yaśodharapura, the Khmer capital of that time, was located. It consists of three shrines, laid out in a row from north to south: the north shrine (dedicated to Viṣṇu), and the central and south shrines (both dedicated to Śiva). The original name of this

temple was Śrī Tribhuvanamahēśvara (Great Lord of the Threefold World), an appellation of Lord Śiva. The temple's modern name, Banteay Srei— citadel of women or citadel of beauty— is most probably related to the intricate bas-relief carvings that can be found on the walls as well as the tiny dimensions of the structures themselves (Freeman and Jacques, 1999: 206). The other explanation is that the temple has got its name from the fact that it has many devatās (female deities of fertility) carved into the walls of the structures (Jessup, 2004: 101). A typical devatā, embellishing each of the corners of the various shrines, is shown as standing with a lamp hung over her head and swans adorning the base. These devatās, with naked torsos and playing with flowers, are known for being the most voluptuous of the Angkor devatās.¹

Located in the area of Angkor, it lies near the hill of Phnom Dei, 25 km (16 mi) north-east of the main group of temples that once belonged to the medieval capitals of Yasodharpura that was association with Nālandā University

1

1.Banteay Srei, the Cambodian Citadel of Women: A Look at the Scenes from the Ancient Indian Epics and the Purāṇas, Karam Tej Sarao at the Conference: International Seminar on Civilizational Dialogue between India and ASEAN, organized by the Ministry of External Affairs and Indian Council of Cultural Relations in and Angkor Thom.

Banteay Srei is built largely of red sandstone, a medium that lends itself to the elaborate decorative wall carvings which are still observable today. The buildings themselves are miniature in scale, unusually so when measured by the standards of Angkorian construction. These factors have made the temple extremely popular with tourists, and have led to its being widely praised as a "precious gem", or the "jewel of Khmer art."



The site of this Temple consists of three concentric rectangular enclosures constructed on an east–west axis. A causeway situated on the axis leads from an outer gopura, or gate, to the third or outermost of the three enclosures. The inner enclosure contains the sanctuary, consisting

of an entrance chamber and three towers, as well as two buildings conventionally referred to as libraries.

The outer gopura

The gopura is all that remains of the outer wall surrounding the town of Isvapura. The wall is believed to have measured approximately 500 m square, and may have been constructed of wood. The gopura's eastern pediment shows Indra, who was associated with that direction, mounted on his three-headed elephant Airavata. The 67 m causeway with the remains of corridors on either side connects the gopura with the third enclosure. North and south of this causeway are galleries with a north-south orientation.

The third (outer) enclosure

The third enclosure is 95 by 110 m; it is surrounded by a laterite wall breached by gopuras at the eastern and western ends.^[21] Neither pediment of the eastern gopura is *in situ*. The west-facing pediment is now located in the Musée Guimet in Paris. It depicts a scene from the Mahabharata in which the Asura brothers Sunda and Upasunda fight over the Apsara Tilottama. The east-facing pediment is lying on the ground. It depicts a scene from the Rāmāyaṇa in which a demon seizes Rama's wife Sita. Most of the area within the third enclosure is occupied by a moat divided into two parts by causeways to the east and west.

The second enclosure

The second enclosure sits between an outer laterite wall measuring 38 by 42 m, with gopuras at the eastern and western ends, and a brick inner enclosure wall, measuring 24 by 24 m.^[21] The western gopura features an interesting bas relief depicting the duel of the monkey princes Vāli and Sugrīva, as well as Rāma's intervention on Sugrīva's behalf. The inner enclosure wall has collapsed, leaving a gopura at the eastern end and a brick shrine at the western. The eastern pediment of the gopura shows Śiva Nataraja; the west-facing pediment has an image of Karaikal Ammaiyan, one of the three women saints amongst the sixty three Nayanmars (hounds of Śiva). Likewise, the laterite galleries which once filled the second enclosure (one each to north and south, two each to east and west) have partially collapsed. A pediment on one of the galleries shows the lion-man Narasiṁha clawing the demon Hiranyakashipu.

The first (inner) enclosure

Between the gopuras on the collapsed inner wall are the buildings of the inner enclosure: a library in the south-east corner and another in the north-east corner, and in the centre the sanctuary set on a T-shaped platform 0.9 m high. Besides being the most extravagantly decorated parts of the temple, these have also been the most successfully restored (helped by the durability of their sandstone and their small scale). In 2010, the first enclosure is open to visitors again, but the inner temples are roped off and inaccessible.

The libraries

The two libraries are of brick, laterite and sandstone. Each library has two pediments, one on the eastern side and one on the western. According to Maurice Glaize, the four library pediments, "representing the first appearance of tympanums with scenes, are works of the highest order. Superior in composition to any which followed, they show true craftsmanship in their modelling in a skilful blend of stylisation and realism."

The east-facing pediment on the southern library shows Śiva seated on the summit of Mount Kailāsa, his mythological abode. His consort Umā sits on his lap and clings anxiously to his torso. Other beings are

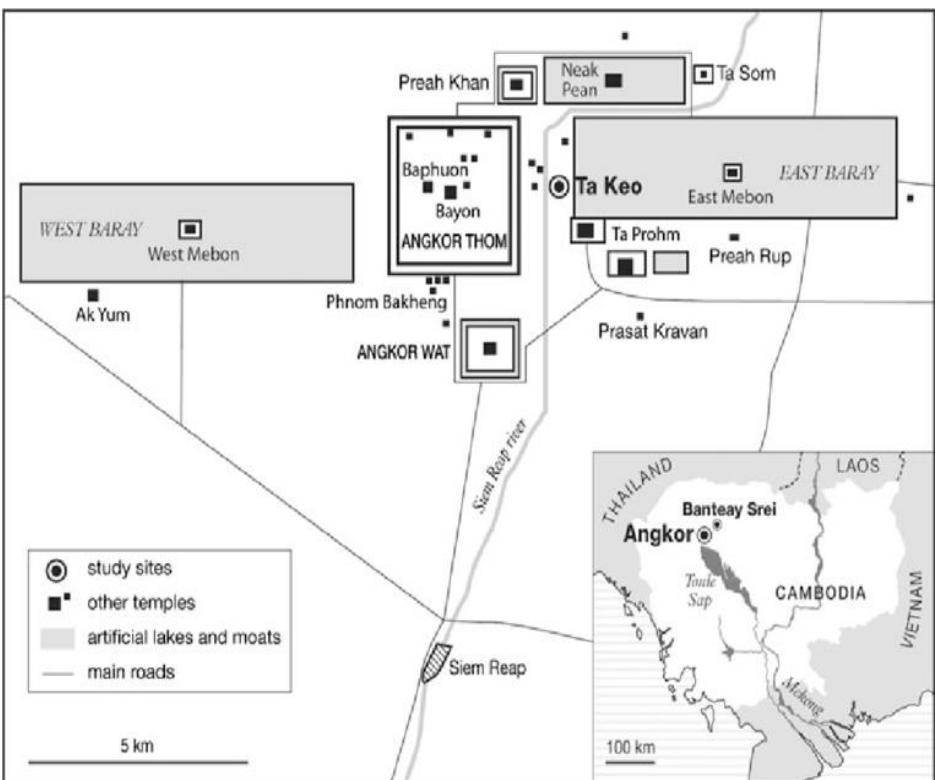
also present on the slopes of the mountain, arranged in a strict hierarchy of three tiers from top to bottom. In the top tier sit bearded wise men and ascetics, in the middle tier mythological figures with the heads of animals and the bodies of humans, and in the bottom tier large animals, including a number of lions. In the middle of the scene stands the ten-headed demon king Rāvaṇa. He is shaking the mountain in its very foundations as the animals flee from his presence and as the wise men and mythological beings discuss the situation or pray. According to the legend, Śiva stopped Rāvaṇa from shaking the mountain by using his toe to press down on the mountain and to trap Rāvana underneath for 1000 years.

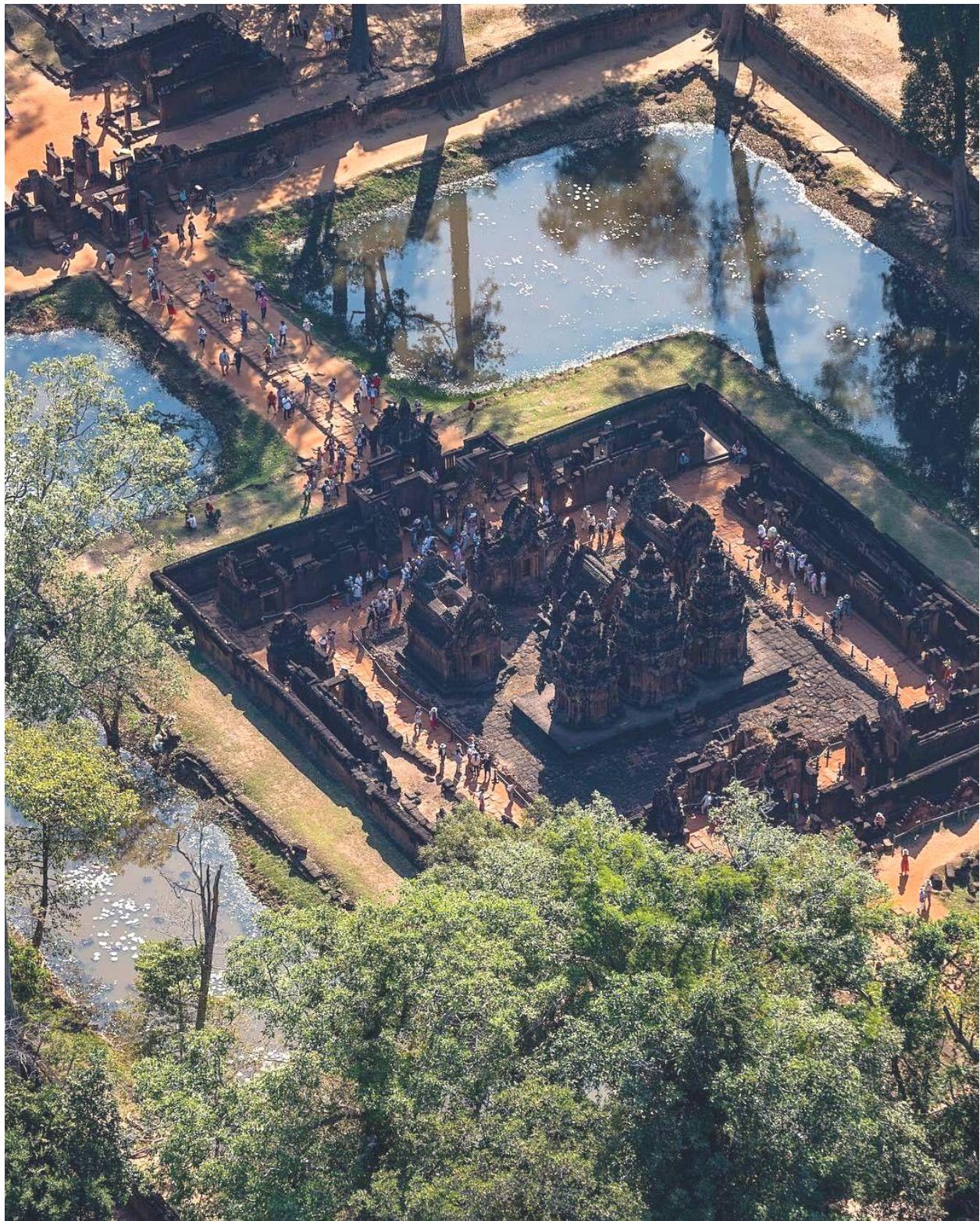
The west-facing pediment on southern library shows Śiva again seated on the summit of Mount Kailāsa. He is looking to his left at the god of love Kāma, who is aiming an arrow at him. Umā sits to Śiva's right; he is handing her a chain of beads. The slopes of the mountain are crowded with other beings, again arranged in a strict hierarchy from top to bottom. Just under Śiva sits a group of bearded wise men and ascetics, under whom the second tier is occupied by the mythological beings with the heads of animals and the bodies of humans; the lowest tier belongs the common people, who mingle sociably with tame deer and a large gentle bull. According to the legend, Kāma fired an arrow at Śiva in order to cause Śiva to take an interest in Umā. Śiva, however, was greatly angered by this provocation, and punished Kāma by gazing upon him with his third eye, frying Kāma to cinders.

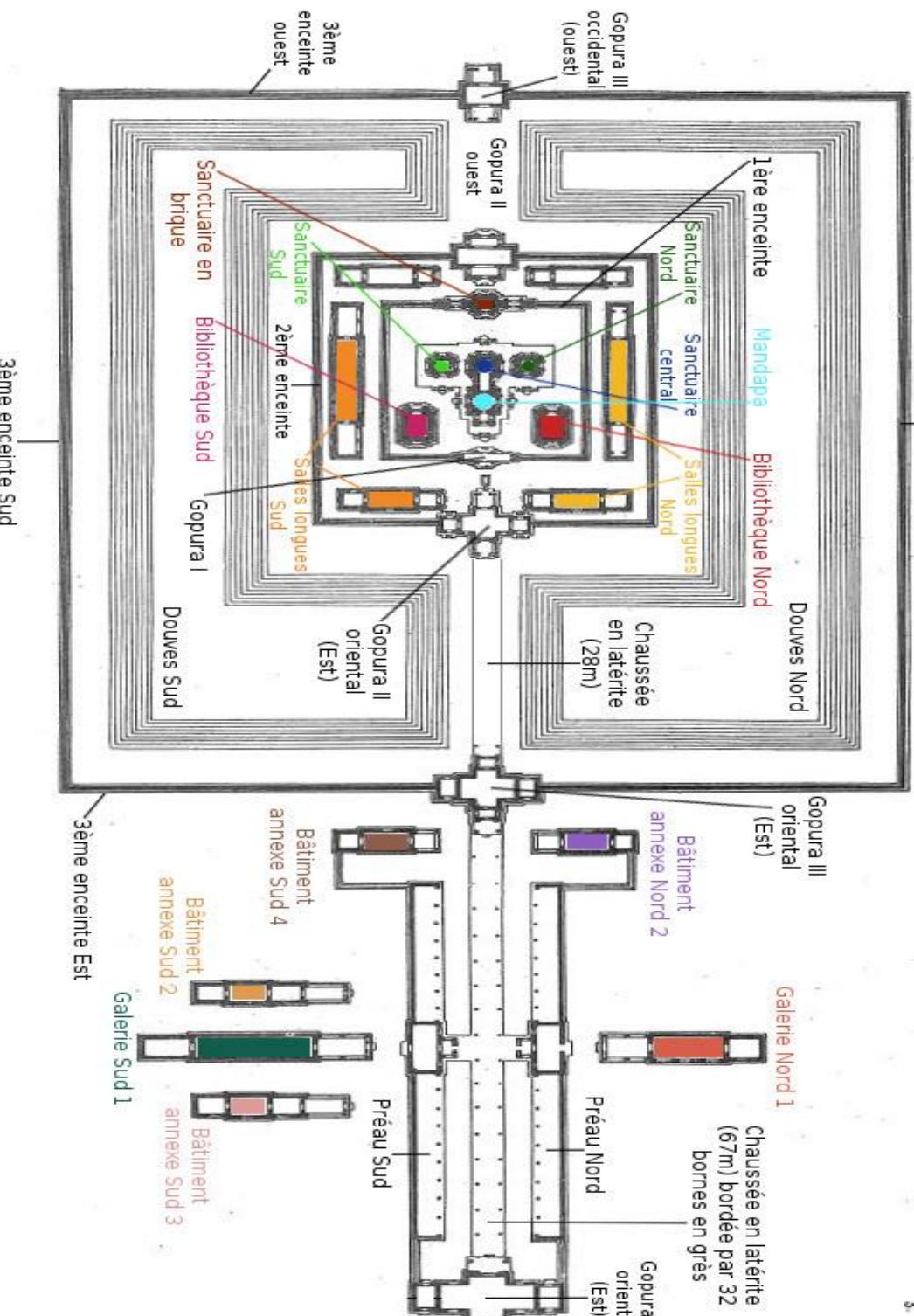
The east-facing pediment on the northern library shows the god of the sky Indra creating rain to put out a forest fire started by the god of fire Agni for purposes of killing the nāga king Takshaka who lived in Khandava Forest. Kṛṣṇa and Arjuna are shown helping Agni by firing a dense hail of arrows to block Indra's rain. Takṣaka's son Aśvasena is depicted attempting to escape from the conflagration, while other animals stampede about in panic.

The sanctuary

The sanctuary is entered from the east by a doorway only 1.08 m in height: inside is an entrance chamber (or maṇḍapa) with a corbelled brick roof, then a short corridor leading to three towers to the west: the central tower is the tallest, at 9.8 m. Glaize notes the impression of delicacy given the towers by the antefixes on each of their tiers. The six stairways leading up to the platform were each guarded by two kneeling statues of human figures with animal heads; most of those now in place are replicas, the originals having been stolen or removed to museums.







Temple de Banteay Srei (pl. XXIII p.228, Les monuments du groupe d'Angkor, 1944, de Maurice Glaize)

Banteay Samre Temple (built early-mid 12th century)

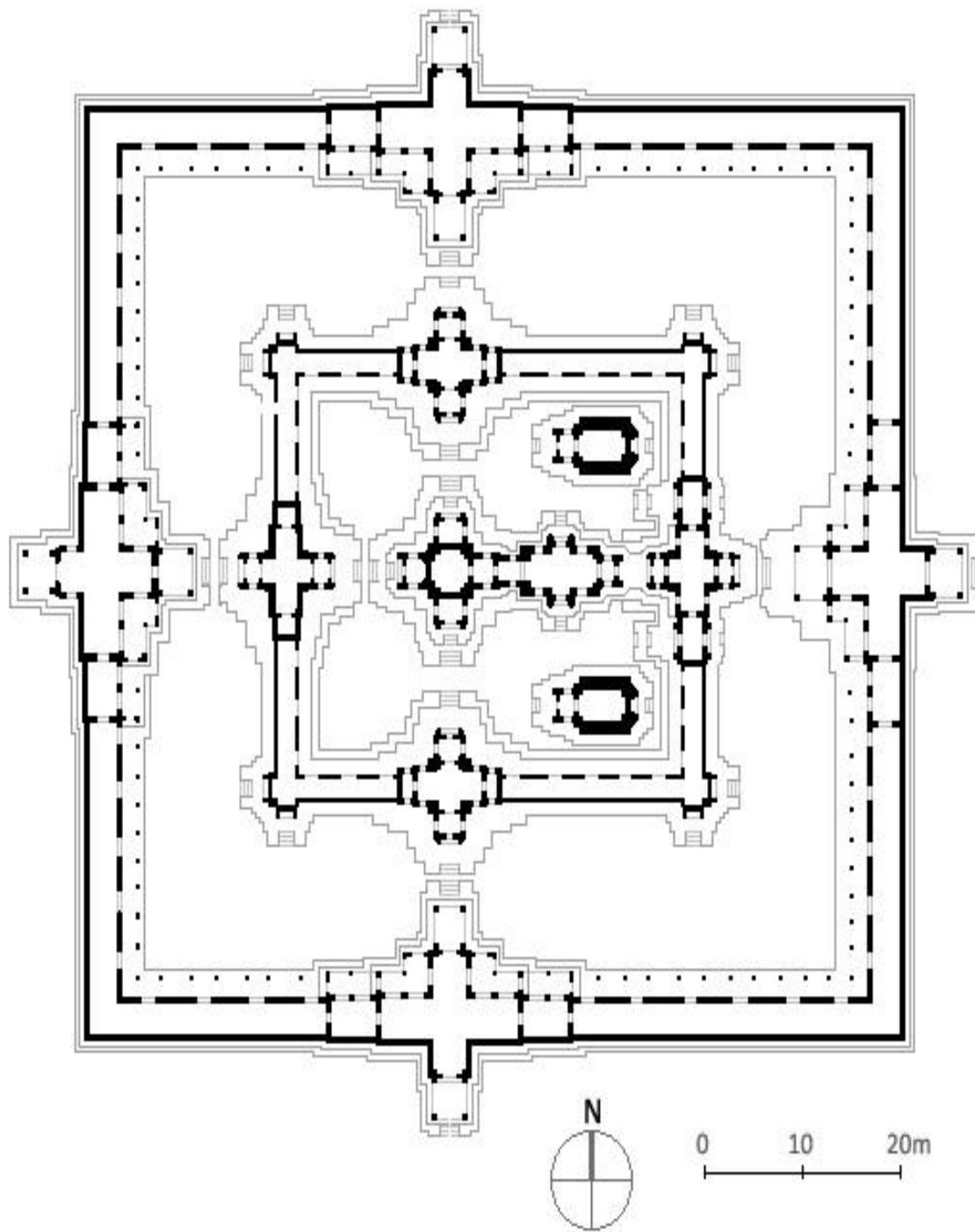


Banteay Samre is a compact and beautifully proportioned temple laid out during the reigns of Suryavarman II and Yasovarman II. It was probably built by a high-ranking official, not by the king, which was unusual but not unheard of (Prasat Kravan, also at Angkor, was another privately built temple). The temple stands about 500 meters east of the southeast corner of the (now dry) eastern baray. Its relative isolation prevents it from receiving as many tourists as the larger temples to the west, although the quality of the bas-reliefs and stonework is among the best at Angkor. In fact, the temple was originally believed to have been erected in the 15th century as the quality of its design suggested that was built at the apex of Khmer artistry and technological know-how.

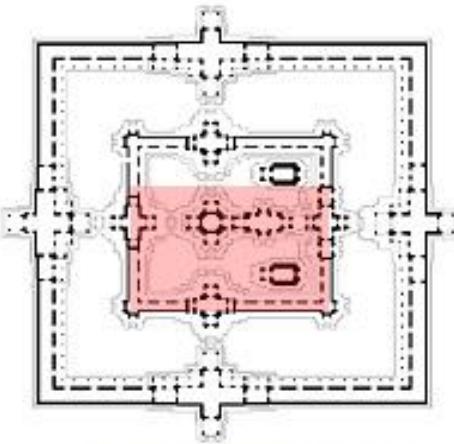
The layout of Banteay Samre is similar in many respects to other temples built in the reign of Suryavarman II, including Chau Say Tevoda, Thommanon, and Angkor Wat. Similar features include the distinctive shape of the central sanctuary's tower, along with the mandapa (antechamber) connected to the central shrine via an *antarala* (small corridor). The layout and positioning of the 'libraries' is also a common feature, as is the series of galleries encircling the

temple's core pavilions. One curious omission at Banteay Samre is the lack of apsara bas-reliefs, which were used extensively in the other major temples of Suryavarman's era.

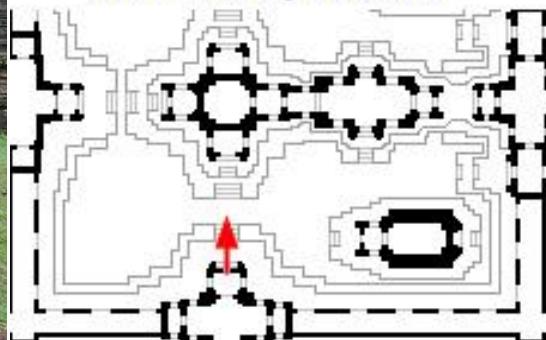
Plan View



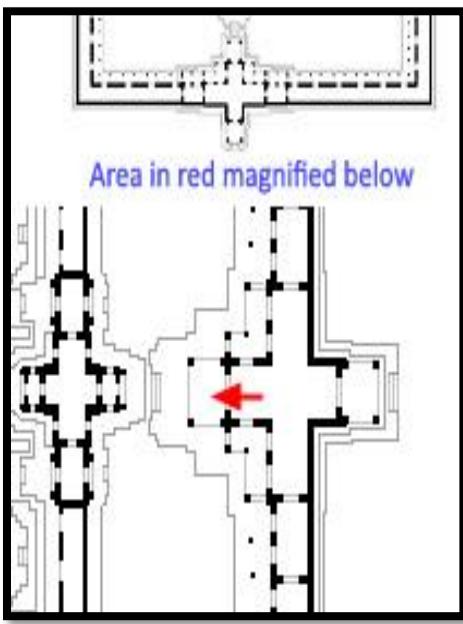
Drawn by Timothy M Ciccone following Claude Jacques, Michael Freeman, and Jean Laur.



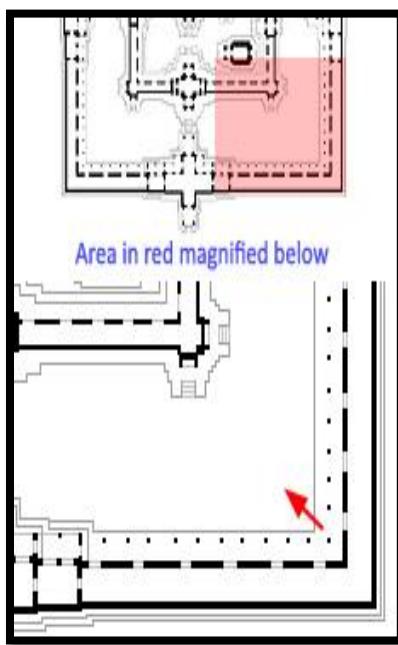
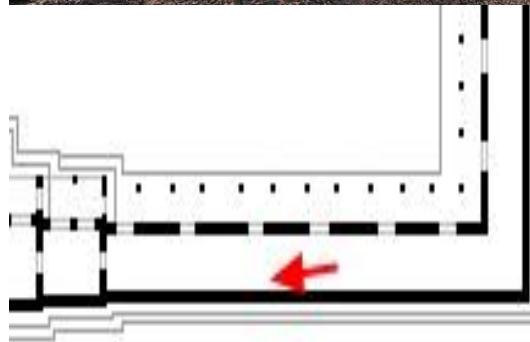
Area in red magnified below

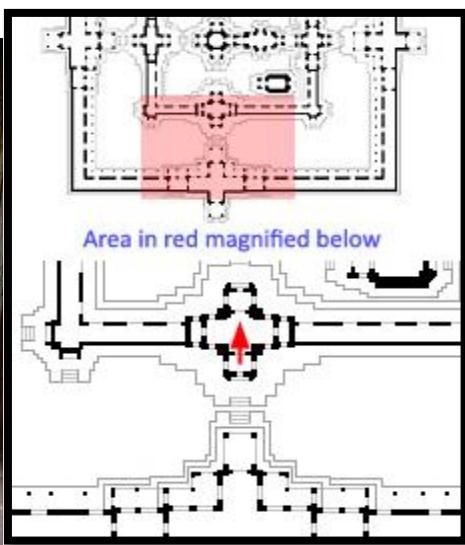
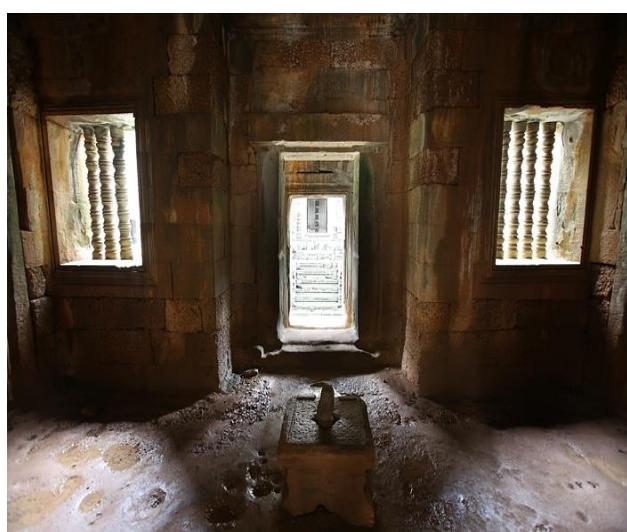
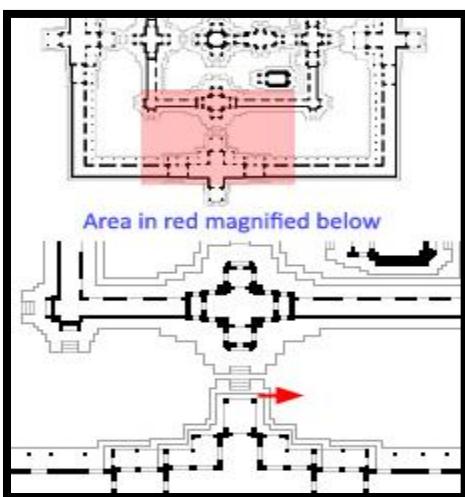
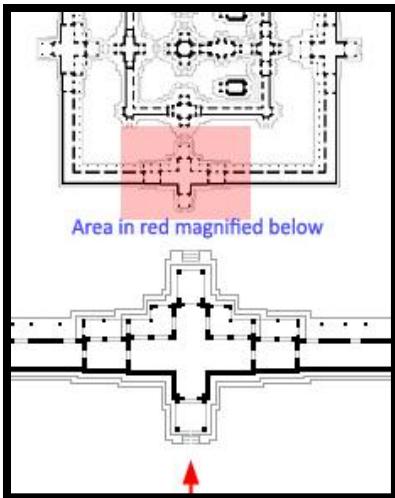


The façade or front part or exterior It is a loan word from the French façade (pronounced [fasad]), which means 'frontage' or 'face'. In architecture, the façade of a building is often the most important aspect from a design standpoint, as it sets the tone for the rest of the building.



Outer Wall or boundary is a line that divides one area from another, called a border and defines the extent of one or more areas that are adjacent or in close proximity.





Garbagriha

with Shivalinga



perimeter design?

Perimeter design is required for any ceiling type and concerns **the point where the ceiling meets a wall or partition (aka where the edges meet)**. This design also considers how the perimeter connection will perform when subjected to lateral loads due to seismic movement.



Chidambaran Nataraja Temple

Iconography of Shiva temples in Tamil Nadu is governed by the Shaiva Agamas (IAST:Āgama) that revere the ultimate reality as the Hindu deity, Shiva. Āgama (Sanskrit: आगम, Tamil:ஆகமம்) in the Hindu religious context means a traditional doctrine or system which commands faith.^[1] Temple worship according to Āgamic rules can be said to have started during the Pallava dynasty (551-901 A.D.) in South India, but they were fully under establishment during the Chola dynasty (848-1279 A.D.).^[2] The temples during the Chola period expanded to Sri Lanka and islands in South East Asia. The temple complex was expanding with niches for various deities on the stipulated sides of the sanctum. *Lingam* was universalised and *prakarams* (precincts) with subsequent deities came up. The temple *parivara*(deities related to primary deity) expanded considerably during the Chola period. The niches of following Āgamic rules for building Shiva temples in Tamil Nadu, a South Indian state continues even in the modern era. Some of the prime images like that of *lingam*, Vinayagar and Parvati are present in all the Shiva temples. Almost all the temples follow the same custom during festivals and worship methods with minor exceptions. Most of the Shiva temples in Tamil Nadu and Sri Lanka (like Munneswaram temple, Koneswaram temple, Tennavaram temple, Ketheeswaram temple, Naguleswaram) are built in Dravidian architecture.

SYMBOLISM Behind the Structures

The temple structure resembles the human body with all its subtleties. The five walls encircling one another are the *koshas* (sheaths) of human existence.^[5] The outermost is the *Annamaya kosha*, symbolizing the material body.^[5] The second is *Pranamaya kosha*, symbolizing the sheath of vital force or *prana* (breath).^[5] The third is *Manomaya kosha*, symbolizing the sheath of the thoughts, the *mana*.^[5] The fourth is the *Vijnanamaya kosha*, symbolizing, the sheath of the intellect.^[5] The fifth and innermost is the *Anandamaya kosha*, symbolizing the sheath of bliss.^[5] Dravidian Shiva temples invariably follow the structure, arranged in differing manners, but differing in themselves only according to the age in which they were constructed.:.^[6]

- The principal part of the temple is called the *Vimanam* which is the roof of the sanctum sanctorum.
- The porches or *Mantapams* (halls), which always cover and precede the door leading to the sanctum.
- Gate-pyramids, *Gopurams* is the principal feature of the temple seen from outside.
- Pillared halls (*Chaultris* or *Chawadis*) are used for festivals and daily gatherings.

A temple always contains temple tanks or wells for water called *theertham* used for sacred purposes of ablution.

These terminologies are not specific to Shiva temples in Tamil Nadu, but common across all temples built in Tamil architecture including most Khmer Hindu temples.

Moola Sannidhi or Garbhagriha

Garbhagriha or **garbha griha** (Devanagari: गर्भगृह) is a Sanskrit word meaning the interior of the sanctum sanctorum, the innermost sanctum of a Hindu temple where resides the murti (idol or icon) of the primary deity of the temple. Literally the word means "womb chamber", from the Sanskrit words *garbha* for womb and *griha* for house. Only *pujari* (priests) are allowed to enter the sanctum.^{[7][8]}

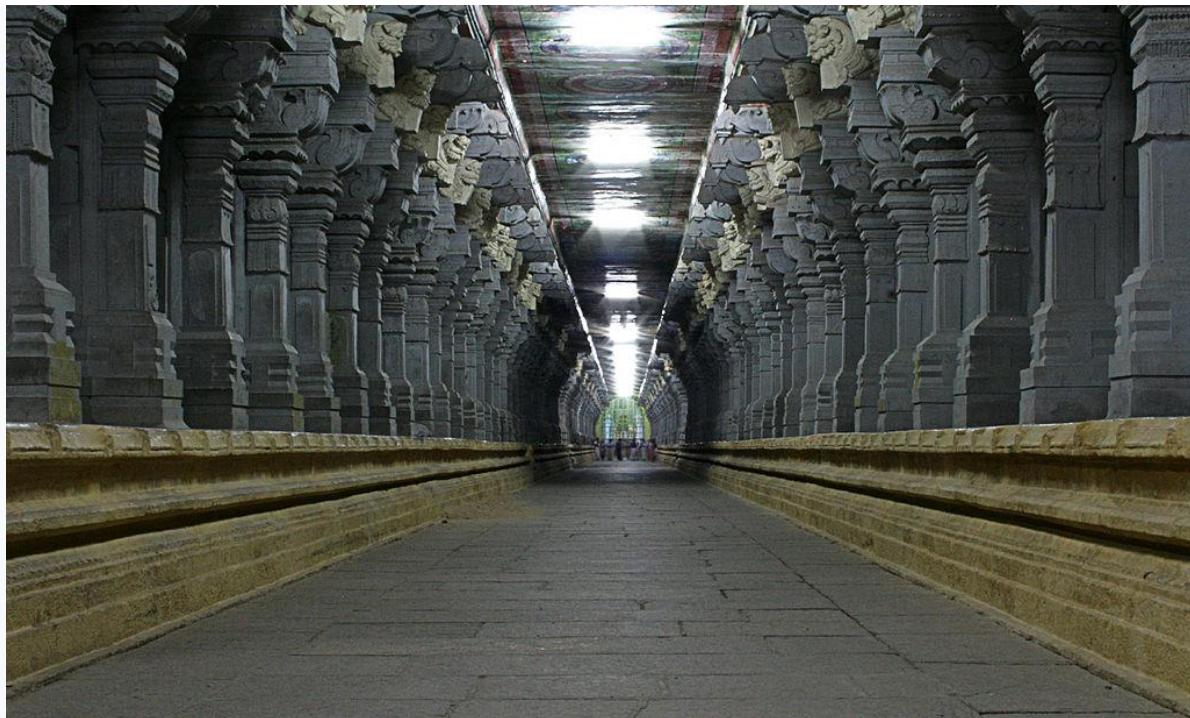
Vimanam



Stoney vimana of Bantey Srei

Vimana (Tamil: விமானம்) is a term for the tower above the *garbhagriha* or Sanctum sanctorum in a Hindu temple.^{[9][10]} The towering roof of the other deities is also called the *vimanam*. These do not assume as much significance as the outer *gopurams* (gateway towers), with the exception of a few temples where the *vimanams* are as famous as the temple complex - *Kanka sabai* (Golden stage) at Thillai Nataraja Temple, Chidambaram covered with golden plates and the Ananda Nilayam *vimanam* of the Tirumala Venkateswara Temple are examples.

Prakaram[



Ramanathaswamy Temple *prakaram*

A **Prakaram**, Sanskrit:प्राकारम्), also spelled *Pragaram* or *Pragaaram*) in Indian architecture is an outer part around the Hindu temple sanctum. These may be enclosed or open and are typically enclosed for the inner most *prakaram*. Typically a Hindu Temple prayer hall is built in front of the temple's sanctum sanctorum (*garbhagriha*) in the first *prakaram*.

Gopuram

A **Gopuram** or **Gopura**, is a monumental tower, usually ornate, at the entrance of any temple, especially in Southern India. This forms a prominent feature of Koils, Hindu temples of the Dravidian architecture. They are topped by the *kalasam*, a bulbous stone or metal finial. The *gopurams* function as gateways through the walls that surround the temple complex.

The gopuram's origins can be traced back to early structures of the Pallava dynasty. By the twelfth century under the Pandya rulers these gateways became a dominant feature of a temple's outer appearance, eventually overshadowing the inner sanctuary obscured from view by the gopuram's colossal size. It also dominated the inner sanctum in amount of ornamentation. Often a shrine has more than one gopuram. The gopuram raises from a square or rectangular granite or brick base to a pyramidal structure with multiple storeys. A temple may have multiple gopurams, typically constructed into multiple walls in tiers around the main shrine. *Rajagopuram* indicates the prime one of all the *gopurams* within the temple. It is typically the most commonly used gateway and the tallest of all.

Lingam

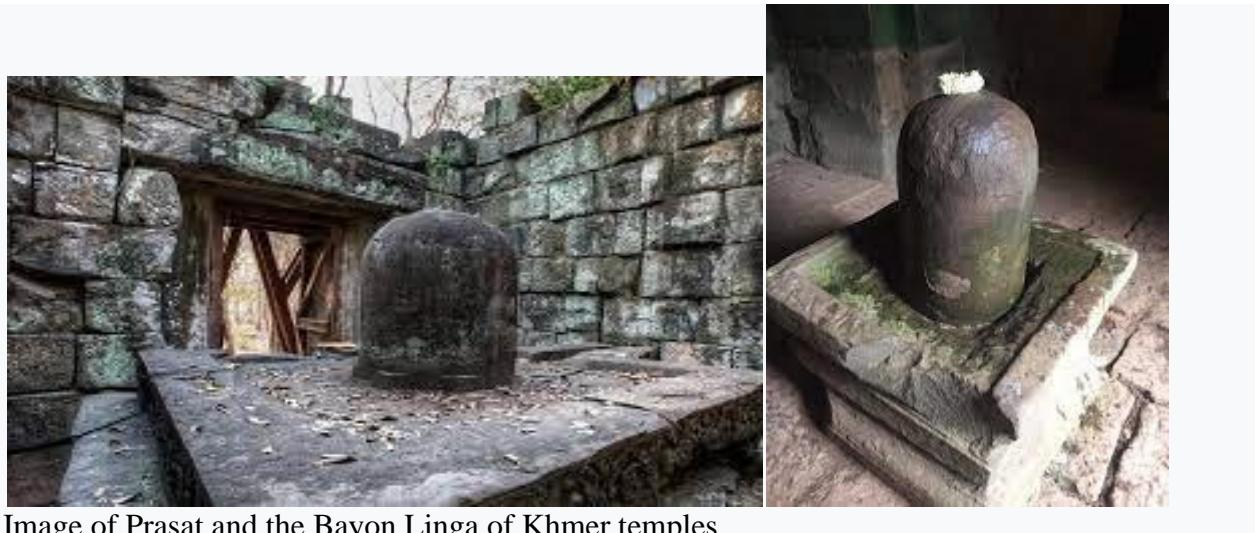
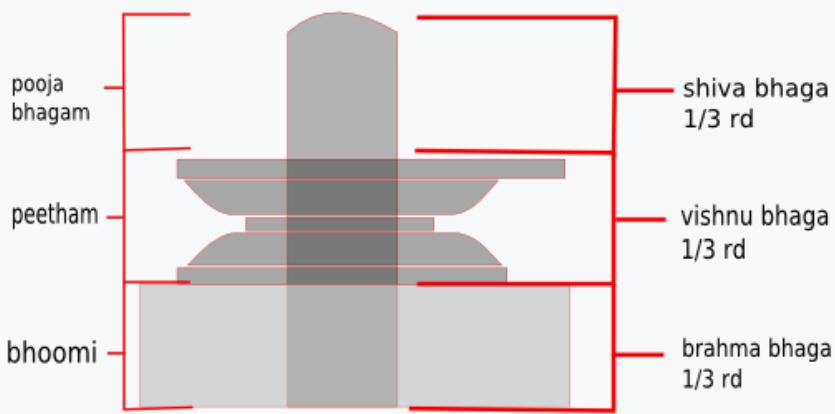


Image of Prasat and the Bayon Linga of Khmer temples



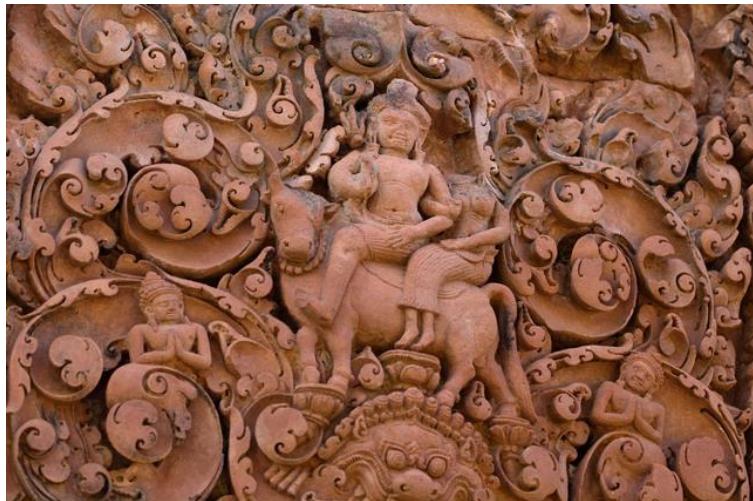
shiva linga represents creative ,protective, destructive aspects supreme cause (god)of the creation

Decorated form of Shiva Lingam

The **Lingam** (also, **Linga**, **Ling**, **Shiva linga**, **Shiv ling**, Sanskrit लिङ्गं *lingam*, meaning "mark" or "sign") is a representation of the Hindu deity Shiva used for worship in Hindu temple. The *lingam* is the principal deity in most Shiva temples in South India. The *lingam* is often represented with the Yoni, a symbol of the goddess or of Shakti, female creative energy. The union of *lingam* and *yoni* represents the "indivisible two-in-oneness of male and female, the passive space and active time from which all life originates". A complementary theory suggests that the *Lingam* represents the beginning and ending *Stambha* pillar symbolizing the infinite nature of Shiva. The propagation of *linga* worship on a large scale in South India is believed to be from Chola times (late 7th century A.D.), through *Rig veda*, the oldest literature details about worshipping Shiva in the form of *linga*.^[21] Pallavas propagated Somaskanda as the principal form of worship, slightly deviating from the *Shaiva agamas*; Cholas being strict *shaivas*, established *lingams* in all the temples. The relation between Shiva and the *lingam* extends to the Indus Valley civilization, where several remains, such as the round stone caps at Harappa and the well-known seal of polycelphalic *yogi* (saint), have led scholars to attribute the primordial native origin.^[23] *Svayambu lingam* indicates a *lingam* that comes into existence on its own accord and not erected by human beings. Some of the temples are built around the *lingam*, with its position maintained as the sanctum.

The temple structures is divided into five *lingams* with the main one at the sanctum supplying power to the rest. The others are *dhvaja lingam* or flag *lingam* (signifying flag pole), *bhadra lingam* or prosperous *lingam* (signifying the *balipeetha*), *stupa lingam* (signifying *vimana* tower) that raises over sanctum and the sacrificer or officiating priest

Parvati



Parvati riding behind Shiva in Angkor Shrine within a Shiva temple

Parvati (Sanskrit: पार्वती, IAST: Pārvatī) is a Hindu goddess. Shaiva tradition is replete with a number of forms of goddesses and all of the consorts. Parvati is the most celebrated and artistic.^[26] Parvati is nominally the second consort of Shiva, the Hindu god of destruction and rejuvenation. However, she is not different from Satī, being the reincarnation of Shiva's wife. Parvati is the mother of the gods and goddesses, Ganesha and Skanda (Kartikeya). Some communities believe her to be the sister of Vishnu. Parvati, when depicted alongside Shiva, generally appears with two arms, but when alone, she is shown having four or eight arms, and astride a tiger or lion. Generally considered a benevolent goddess, Parvati also has wrathful incarnations, such as Durga, Kali, Shitala Devi, Tara, Chandi, and the Mahavidyas as well as benevolent forms like Kathayayini, Mahagauri, Kamalatmika, Bhuvaneshwari, and Lalita.

Ganesha



The shrine of Ganesa inside a temple in Angkor Thom

Ganesha (Sanskrit: गणेश; IAST: Ganeśa; listen (help·info)), also spelled **Ganesa** or **Ganesh**, also known as **Ganapati** (Sanskrit: गणपति, IAST: gaṇapati), Vinayaka (Sanskrit: विनायक; IAST: Vināyaka), and Pillaiyar (Tamil: பிள்ளையார்), is one of the deities best-known and

most widely worshipped in the Hindu pantheon.^[28] Ganesa is the first son of Shiva and is given the primary importance in all Shiva temples with all worship starting from him. Local legend states the Tamil word Pillayar splits into *Pillai* and *yaar* meaning who is this son, but scholars believe it is derived from the Sanskrit word *pulisara* meaning elephant.^[29] K. A. Nilakanta Sastri (1963:57-58) thinks that Pallavas adopted the Ganesa motif from Chalukyas.^[30] During the 7th century, Vatapi Ganapati idol was brought from Badami (Vatapi - Chalukya capital) by Paranjothi, the general of Pallavas who defeated Chalukyas

Skanda-Murugan (Sanskrit: सुब्रह्मण्य, Sanskrit: कार्तिकेय)-also called Kartikeya, Skanda and Subrahmanya, is more popular in South India especially among Tamil people famously referred as *Thamizh Kadavul* (God of Tamils). He is the patron deity of the Tamil land (Tamil Nadu). Like most Hindu deities, he is known by many other names, including *Senthil* (*Smart*), *Saravaṇa*, *Kārtikeya* (meaning 'son of Krittika'), Arumugam, Sanmuga(from Sanskrit *Śaṅmukha*), Shadanana (meaning 'one with six faces'), *Kumāra* (meaning 'child or son'), *Guhan* or *Guruhuha* (meaning 'cave-dweller'), *Skanda* (meaning 'that which is spilled or oozed, namely seed' in Sanskrit),^[31] *Subrahmaṇya*, *Vēlañ* and Swaminatha. *Tolkappiyam*, possibly the most ancient of the extant Sangam works, dated between the 3rd century BCE and 5th century CE glorified Murugan, " the red god seated on the blue peacock, who is ever young and resplendent," and " the favoured god of the Tamils.". The Sangam poetry divided space and Tamil land into five allegorical areas and according to the *Tirumurugarruppatai* (circa 400-450 A.D.) attributed to the great Sangam poet Nakkirar, Murugan was the presiding deity of the Kurinci region (hilly area). *Tirumurugarruppatai* is a deeply devotional poem included in the ten idylls (*Pattupattu*) of the age of the third Sangam. The cult of Skanda disappeared during the 6th century and was predominantly expanded during late 7th century Pallava period - Somaskanda sculptured panels of the Pallava period stand as a testament.

Shiva is worshipped in 9 forms

namely *Linga*, *Lingodbhava*, *Chandrashekha*, *Somaskandha*, *Bhairava*, *Veerabhadra*, *Nataraja*, and *Dakshinamoorthy*

Lingothbhava or emergence of *linga*, found in various *puranas* as a symbol of Shiva, augments the synthesis of the old cults of pillar and phallic worship. The idea emerged from deity residing in a pillar and later visualised as Shiva emerging from the *lingam*.The *lingothbhavar* image can be found in the first precinct around the sanctum in the wall exactly behind the image of Shiva. Appar, one of the early *Saivite* saint of the 7th century, gives evidence of this knowledge of *puranic* episodes relating to *Lingothbhavar* form of Shiva while Tirugnana Sambandar refers this form of Shiva as the nature of light that could not be comprehended by Brahma and Vishnu.



Nataraja Above pics in Thailand **Lintel on Prasat Sdok Kok Thom, Thailand** More description from Art and Archeology Style: Angkor Wat, Suryavarman II Completed: 1113-1150 CE In the center, a ten-a...right pic in Angkor

Nataraja or Nataraj, *The Lord (or King) of Dance* (Kooththan)) is a depiction of the Hindu god Shiva as the cosmic dancer Koothan who performs his divine dance to destroy a weary universe and make preparations for god Brahma to start the process of creation. A Tamil concept, Shiva was first depicted as Nataraja in the famous Chola bronzes and sculptures of Chidambaram. The dance of Shiva in Tillai, the traditional name for Chidambaram, forms the motif for all the depictions of Shiva as Nataraja. He is also known as "Sabesan" which splits as *Sabayil aadum eesan* in Tamil which means "The Lord who dances on the dais". The form is present in most Shiva temples in South India, and is the main deity in the famous temple at Chidambaram. The sculpture is usually made in bronze, with Shiva dancing in an aureole of flames, lifting his left leg (or in rare cases, the right leg) and balancing over a demon or dwarf (Apasmara) who symbolizes ignorance.

Dakshinamurthy or Jnana Dakshinamurti: दक्षिणामूर्ति is an aspect of Shiva as a guru (teacher) of all fields. This aspect of Shiva is his personification of the ultimate awareness, understanding and knowledge. The image depicts Shiva as a teacher of yoga, music, and wisdom, and giving exposition on the *shastras* (vedic texts) to his disciples. He is worshipped as the god of wisdom, complete and rewarding meditation. This form of Shiva is popular in the Southern states of India especially Tamil Nadu. *Dakshina* indicates south and this deity is south facing usually depicted in the wall of first precinct around the sanctum.



Navagraha

Read my excellent ... 9 Graha Puja performed at Bantey Sarai

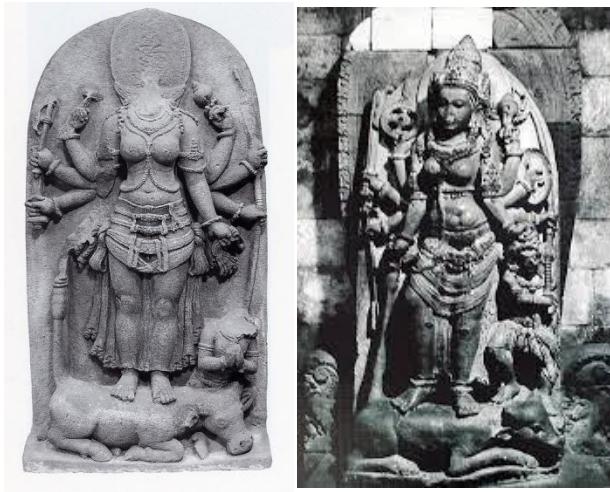
https://www.academia.edu/69010081/9_Graha_Puja_performed_at_Bantey_SaraiGraha (from

Sanskrit ग्रह—gráha—seizing, laying hold of, holding) is a 'cosmic influencer' on the living beings of mother Bhumidevi (Earth). In Hindu astrology, the Navagraha (Sanskrit: नवग्रह, *nine seizers* or *nine influencers*) are some of these major influencers. All the navagraha have relative movement with respect to the background of fixed stars in the zodiac. This includes the planets: Mars, Mercury, Jupiter, Venus, and Saturn, the Sun, the Moon, as well as positions in the sky, Rahu (north or ascending lunar node) and Ketu (south or descending lunar node).

As per Hindu customs, the Navagraha are typically placed in a single square with the Sun (Surya) in the center and the other deities surrounding Surya; no two of them are made to face each other. In South India, their images are generally found in all important Shiva temples. They are invariably placed in a separate hall, on a pedestal of about three feet in height, usually to the north-east of the *sanctum sanctorum*.

There are 2 kinds of installation of the planets when arranged in this fashion, known as *Agama Pradishta* and *Vaidika Pradishta*. In *Agama Pradishta*, Surya occupies the central place, Chandra on Surya's east, Budha on his south, Brihaspati on his west, Shukra on his north, Mangala on his south-east, Shani on his south-west, Rahu on north-west and Ketu in the north-east. Temples such as Suryanar temple, Tiruvidadaimarudur, Tiruvaiyaru and Tiruchirappalli follow this system. In *Vaidika Pradishta*, Surya is still in the centre, but Shukra is in the east, Mangala in the south, Shani in the west, Brihaspati in the north, Chandra in the south-east, Rahu in the south-west, Ketu in the north-west and Budha in the north-east.

Durga



Metropolitan Museum of Art-The Goddess Durga Victorious over the Buffalo Demon, Mahisha (Mahishasuramardini) | Indonesia (Java) | Central Javanese period | The Metropolitan Museum of Art/ Prambanan Temple Durga

Durga (Sanskrit: दुर्गा); (listen: Durga (help·info)); meaning "the inaccessible" or "the invincible"; "one who can redeem in situations of utmost distress" is a form of Devi, the supremely radiant goddess, depicted as having eighteen arms, riding a lion or a tiger, carrying weapons and a lotus flower, maintaining a meditative smile, and practicing mudras, or symbolic hand gestures. The name is made of Sanskrit *dur-* = "with difficulty" (compare Greek δύσ- (*dys-*)) and *gā* ("come", "go"). The buffalo sacrifice depiction transposes into ritual Durga's feat killing the buffalo demon. The deity is north facing usually depicted in the wall of first precinct around the sanctum. In Tamil Nadu Shiva temples, she stands gracefully on the severed head of buffalo and lion is rarely included.

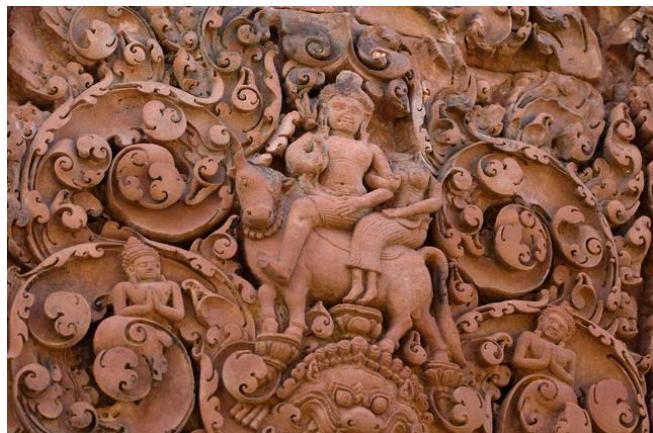
Sapthamatha are a group of seven Hindu goddesses who are always depicted together. Since they are usually depicted as a heptad, or *Saptamatrikas* (Sanskrit: *saptamātṛkās*, सप्तमातृका, "seven mothers"): Brahmani, Vaishnavi, Maheshvari, Indrani, Kaumari, Varahi and Chamunda or Narasimhi. In Tamil Nadu temples, the *sapthamtha* is rarely represented in the dancing form compared to their northern counterparts.



This Sapthamathas might be in a separate Temple. Sapthamathas are in a single panel. Vinayagar and Verabhathirar are individual sculptures. This Sapthamathas is now called as Porayatha. Annual festival is being celebrated by the Villagers during Tamil Aadi month. As per the Experts this sapthamathas panel may belongs to Pallava Period 9-10th Century.

Nandi

Each main deity of the Shiva temple has a vehicle associated with them - Shiva has *Nandi*(sacred bull), Parvati has lion, Muruga has peacock and Vinayagar has mice. Nandi or Nandin (Tamil: நந்தி Sanskrit: नंदी), is now universally supposed to be the name for the bull which serves as the mount (Sanskrit: *vāhana*) of Shiva and as the gate keeper of Shiva and Parvati in Hindu mythology. Temples venerating Shiva and Parvati display stone images of a seated Nandi, generally facing the main shrine. There are also a number of temples dedicated solely to Nandi. But the application of the name Nandin to the bull (Sanskrit: *vṛśabha*) is in fact a development of recent centuries, as Gouriswar Bhattacharya has documented in an illustrated article entitled "Nandin and Vṛśabha"



**Bas relief of Shiva Uma on Nandi the bull in red sandstone at Banteay Srei
Angkor Wat Siem Reap Cambodia-
RIGHT PIC at Angkor Wat**

Chapter 6

Craft of Stone Carved Sculptures and Idols-Prof. Bibhudutta Baraland Mr. Antony William

The Village Shivarapatna is very well known for its intricate carvings on black and grey granite to make idols for temples. The Shivarapatna craft is popular all over India and abroad. There are myths that “During the period of Ganga Dynasty a ‘shilpi’ (Craftsperson) named Basulinga Acharya was traveling from a place which were near Karnataka and Tamil Nadu border in then India to some other place and he spent a night in a Dharmashala in the village Shivarapatna. After cooking the food in the night, he took some pieces of charcoal and drawn an idol on the wall, which was very beautiful. Next morning few villagers saw the line drawing and got surprised by the skill of him. This news spread like wild fire in the village and the king got to know about this. He came to the village to meet him and asked him to stay in the village and practice the craft and offered him land in the village to stay. There onwards the craft flourished in the village.

The Ganga dynasty that ruled Karnataka started traditional sculptures that have been continuing for two thousand years. Basavalingachari from the Jakanacharya hereditary started the Vishwakarma community structures. They came in groups and they settled in the village to construct temples. The Vishwakarma structures has been given the name Shilparamam and the village making these stone structure came to be known as the Heritage Village, by the government recently. Below outlined an account of the family which has been routinely engaged in stone craft. A case study method was followed for covering the practice of stone craft by an average craftsman’s family.

Family Members : 4-6

Work force : Outsourced Labour locally (3-6 Nos.)

Hours of work per day : 8-10 hours

• Education:

Master had taught the craft of Shilpkala to the whole village. The disciples became the new masters of their families. The family passes on their traditional knowledge of craft to the next generation. Children study in school to the age of 15 after which they work under their family elders for gaining skills in stone craft.

• Source of Raw Material:

The Stone is procured from the quarry named ‘Krishna Salai. The rocks are transported to the ‘Mahalakshmi ’ industrial area (5 kms) and are cut according to pre decided dimensions. The master himself chooses the rocks according to the sculpture ordered by the client.

Raw Material:

Stone— Sandstone, soft stone, Granite and marble, Brass, Silver, Gold and Panch Loha (Bronze, Gun metal, Gold, silver, Copper), Fibre (Acrylic and Fibre reinforced plastic).

• Clients:

Donors of temples belonging to the following states, Karnataka, Andhra Pradesh Tamil Nadu, Kerala, Orissa Uttar Pradesh, Rajasthan and Gujarat.

• Custom:

Ladies are not allowed to work on the idols as they are deities. The task is divided among the artisans according to the process (Cutting, Drawing, rough finishing, final finishing).

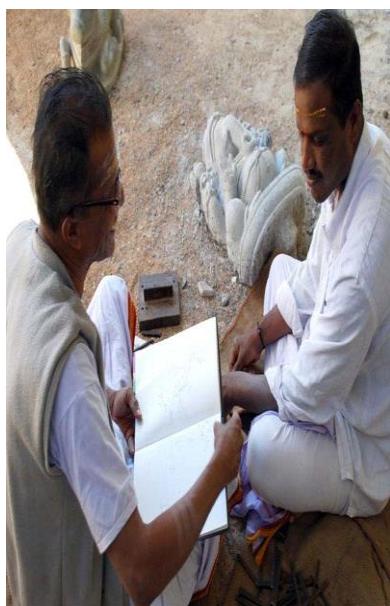
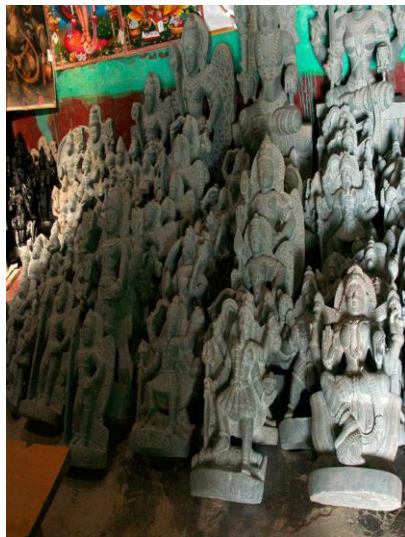
Duration of Sculpting:

2 weeks – 2 months and also up to 9 months in some cases (Subjected to scale, amount of detailing).

Tradition, culture and values represent Shivarapatna which is synonymous with the word sculpture and currently with about 700 members of 300 families are engaged in stone craft. The sculptors of Shivarapatna in Karnataka keep alive the 1,000-year-old artistic tradition.

Shivarapatna is a unique village in the country which has been made into a traditional sculpture centre. Shivarapatna is- also renowned for its metal casting (Pancha Loha, an alloy of copper, zinc, lead, silver, and gold). Deities and warriors of Chalukyan Period are the main source of inspiration for Shivarapatna sculptures. It is believed that the Shilpi's, sculptors, of Shivarapatna are descendants of the craftsmen who constructed the temples of Belur, Hampi and Hoskote.







Stone Craft Factory-Village and Stone Craft-Making Process



Process and Techniques:

The carving process essentially has the following sequence:

- Selection of the stone (Hard granite, Soft Gray granite, Mysore stone, White granite) is done on the basis of the sculpture to be made, depending on male or female carving the artist wants.
- The artist prepares detailed Sketching of the sculpture in the form of template on the hard paper, if necessary he also makes the clay models too. If there is a change in the figure style e.g., cloth draping etc., he also makes a wax model of the sculpture, in small scale. All these techniques not only give the artist the rough idea of the sculpture, but it also helps them to understand the proportion of the sculpture. This helps the master craftsmen to communicate with their fellow craftsmen who work under them as trainee regarding the understanding of the form.

The master craftsmen divide the work of sculpting into the three parts depending on the shape and size of the structure to be made.

- The master craftsman does the marking on the rough stone.
- The trainee or the helping craftsman who is/are semi-skilled or in learning stage removes the rough extra part of the stone.
- The master craftsman himself does the final finishing.
- After getting the exact pictures of the sculpture, Dimensions of the figure to be manufactured are marked on a stone slab, the rough and extra portion are removed in order to get the basic shape, smooth or flat dressing is made to define each and every details. The marking on the stone is done by the red oxide in several layers. The red oxide is commonly available locally. The metal is crushed and then mixed with water in order to make red colour out of red oxide. The colour marks on the stone surface do not vanish while chiseling the surface.
- Final finishing of the surface is done by carborundam stones (Chane Kallu) & final polishing is done with water and emery papers. If the sculpture has to be painted in black, it is done with the colours which are extracted from local fruits, as sarkai, annabare and kenbabari (dry fruit) - these raw materials are heated, melted and used as colour pigment.

The main techniques used are as follows :

- Cutting - Round chisel, Flat chisel, Hammer (all of different size).
- Grinding - Die grinder with different beats size, Channel cutter.
- Buffing - Hand buffer, traditionally made coconut shell hair brush.
- Polishing - Local fruits, as sarkai, annabari and kenbabari (dry fruit) are used.

Raw Material:

Hand Tools:



Tools and Raw Materials

Common Tools used for Stone Crafts are:

- Compass (Ttiwar)
- Pencil
- Steel ruler (L-shape)
- Red oxide to mark center and base of the statue
- Hammer
- chisels of different sizes and points
- Blades
- Grinding stone (to polish)
- Brick to sharpen the tools
- Cloth or brush to take the dust out (while polishing)
- Power Drill
- Die Grinder
- Stone Cutter

Raw Materials:

Raw materials used are:

- Stone— Sandstone
- Soft stone
- Granite and marble,
- Brass, Silver, Gold and Panch Loha (Bronze, Gun metal, Gold, silver, Copper)
- Fibre (Acrylic and Fibre reinforced plastic)

The stone used to make idols for temples as well as of a human consists of Black and grey granite which are locally available. In traditional language the artisans of the village call the black granite as '*Purush Shila*' (Male Stone) and the grey granite as '*Stree Shila*' (Female Stone), which is less hard, than the male stone. The artisan chooses the stones for making the idols according to the characteristics of the god or goddesses.

Few other stones are also imported from other states to make idols when there are any specific requirements of the client. Mostly the stone carving is done with the help of various traditional hand tools, which includes various kinds of iron chisels and hammers along with some measuring instruments like right angles and compass of various sizes. For finishing, waste grinding stones of various grades from the industries is used. The craftsman forge the iron chisels and they themselves do maintenance work like regular sharpening of the same in-house. In current time in order to increase productivity the artisans have started using basic power tools also like Power drills, Die grinders, stone cutters etc.











Working Posture:



Power Tool:



The view of working environment gives the idea of how the work is carried out. Raw materials on one side, working craftsmen, tools used, view of complete and incomplete structures. In one case it was seen that the craftsman divides his work area into two parts:

- Sculpting area
- Back yard for display

Though the backyard was small the craftsman had used this space efficiently to display his sculptures for visitors to see and purchase. He blended his contemporary work with his traditional work and this way he could portray his capability to cater different and new requirements.





<http://www.dsource.in/resource/shivarapatna-stone-crafts-ii/making-process>

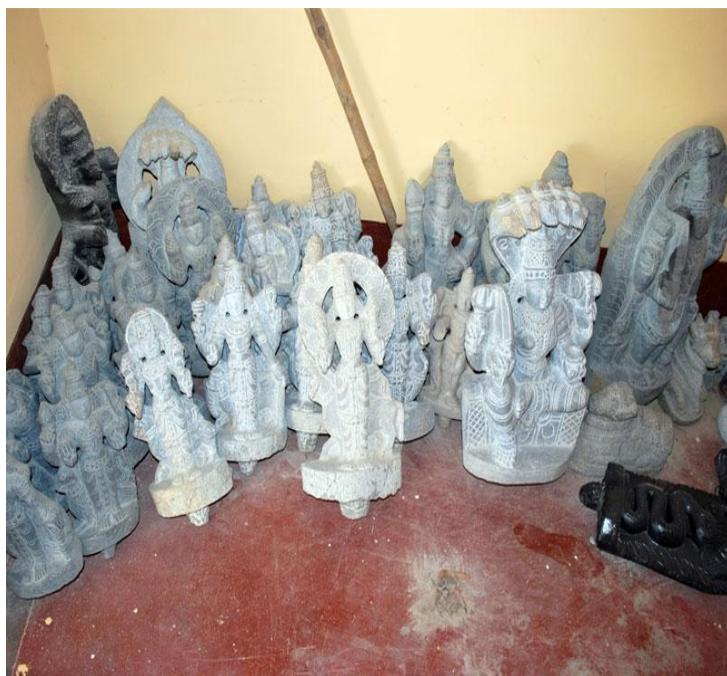
Products

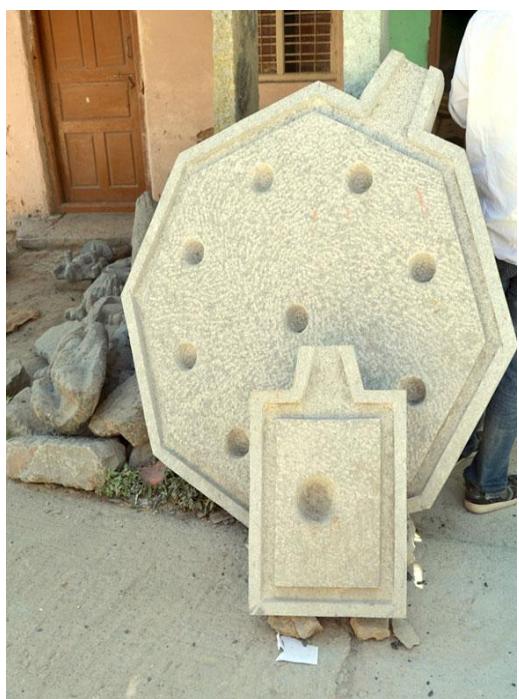
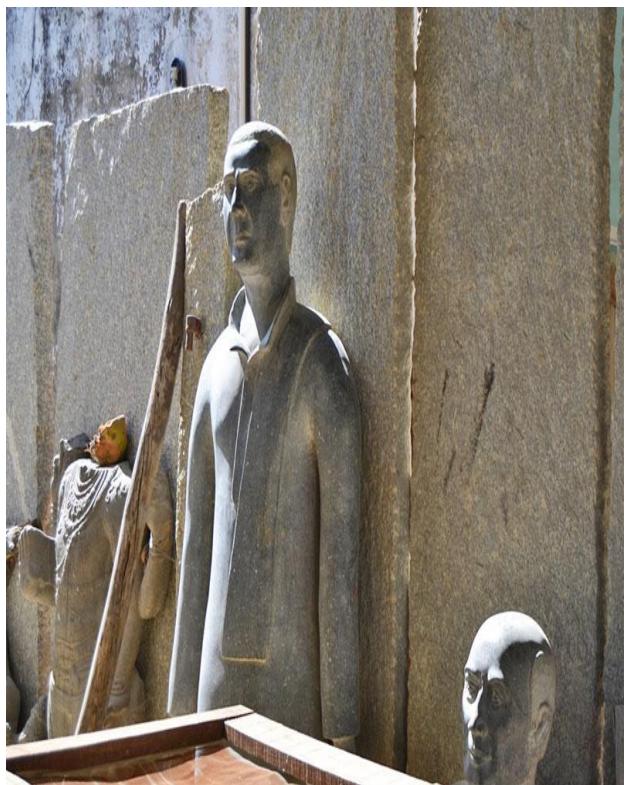
The products one can find in Shivarapatna are mainly idols and statues for temples. The figures represented are common figures and deities of the Hindu religion. The same designs have been used for generations, respecting the traditional proportions of the sculptures. Generally the statues have the natural colour of the stone, but they can also be painted, in black or various colours.

The colours are made of local fruits, as *sarkai*, *annabra* and *kenbabari* (dry fruit). They are heated, melted and used as colour pigment. The artisans can also create personalized sculptures of their clients, whose picture is kept in front of the statue as the work progress. The finer the lines are, the more expensive the product will be. The price for one statue can be up to Rs. 25/- and a set of 4 statues costs Rs. 100/-. The price depends also on the dimensions of the idol.









Chapter 7

ROCKS AS A TEMPLE MATERIAL



1. Introduction to Rock-cut architecture is the creation of structures, buildings, and sculptures by excavating solid rock where it naturally occurs. Rock-cut architecture is designed and made by man from the start to finish. In India and China, the terms *cave* and *cavern* are often applied to this form of man-made architecture. However, caves and caverns that began in natural form are not considered to be rock-cut architecture even if extensively modified. Although rock-cut structures differ from traditionally built structures in many ways, many rock-cut structures are made to replicate the facade or interior of traditional architectural forms. Interiors were usually carved out by starting at the roof of the planned space and then working downward. This technique prevents stones falling on workers below. The three main uses of rock-cut architecture were temples (like those in India), tombs (like those in Petra, Jordan) and cave dwellings (like those in Cappadocia, Turkey).

Some rock-cut architecture, mostly for tombs, is excavated entirely in chambers under the surface of relatively level rock. If the excavation is instead made into the side of a cliff or steep slope, there can be an impressive facade, as found in Lycian tombs, Petra, Ajanta and elsewhere. The most laborious and impressive rock-cut architecture is the excavation of tall free-standing monolithic structures entirely below the surface level of the surrounding rock, in a large excavated hole around the structure. Ellora in India and Lalibela in Ethiopia (built by the Zagwe dynasty) provide the most spectacular and famous examples of such structures.

Rock-cut architecture, though intensely laborious with ancient tools and methods, was presumably combined with quarrying the rock for use elsewhere; the huge amounts of stone removed have normally vanished from the site. It is also said to be cut, hewn, etc., "from the living rock".^[2] Another term sometimes associated with rock-cut architecture is monolithic architecture, which is rather applied to free-standing structures made of a single piece of material. Monolithic architecture is often rock-cut architecture (e.g. Ellora Kailasanathar Temple), but monolithic structures might be also cast of artificial material, e.g. concrete.



The 57ft high monolithic statue of Bahubali (Gommateshwara statue) built in 981 CE in India. The Gommateshwara statue (Bahubali), the largest monolithic statue in the world, at Shravanabelagola, Karnataka, India, was built in 983 CE and was carved from a large single block of granite.^{[3][4]} In many parts of the world there are also rock reliefs, relief sculptures carved into rock faces, outside caves or at other sites.

2. Introduction: There are more than 1,500 known rock-cut structures in India. Many of these structures contain artwork of global importance, and most are adorned with exquisite stone carvings. These ancient and medieval structures represent significant achievements of structural engineering and craftsmanship. The effort expended often astonishes visitors, but seen from one aspect, a rock-cut structure is a decorated rock quarry; most of the stone removed was typically put to economic use elsewhere.

Indian rock-cut architecture is more various and found in greater abundance in that country than any other form of rock-cut architecture around the world. Rock-cut architecture is the practice of creating a structure by carving it out of solid natural rock. Rock that is not part of the structure is removed until the only rock left makes up the architectural elements of the excavated interior. Indian rock-cut architecture is mostly religious in nature.

First wave of construction (2nd century BCE–4th century CE)

The Great Chaitya in the Karla Caves, Maharashtra, India, 1st-century CE. Probably owing to the 2nd century BCE fall of the Mauryan Empire and the subsequent persecutions of Buddhism under Pushyamitra Sunga, it is thought that many Buddhists relocated to the Deccan under the protection of the Andhra dynasty, thus shifting the cave-building effort to western India: an

enormous effort at creating religious caves (usually Buddhist or Jain) continued there until the 2nd century CE, culminating with the Karla Caves or the Pandavleni Caves. These caves generally followed an apsidal plan with a stupa in the back for the chaityas, and a rectangular plan with surrounding cells for the viharas.

When Buddhist missionaries arrived, they naturally gravitated to caves for use as temples and abodes, in accord with their religious ideas of asceticism and the monastic life.

Second wave of cave construction (5th–6th century CE)

The construction of caves would wane after the 2nd century CE, possibly due to the rise of Mahayana Buddhism and the associated intense architectural and artistic production in Gandhara and Amaravati. The building of rock-cut caves would revive briefly in the 6th century CE, with the magnificent achievements of Ajanta and Ellora, before finally subsiding as Hinduism replaced Buddhism in the sub-continent, and stand-alone temples became more prevalent.

The Ajanta Caves in Maharashtra, a World Heritage Site, are 30 rock-cut cave Buddhist temples carved into the sheer vertical side of a gorge near a waterfall-fed pool located in the hills of the Sahyadri mountains. Like all the locations of Buddhist caves, this one is located near main trade routes and spans six centuries beginning in the 2nd or 1st century B.C. A period of intense building activity at this site occurred under the Vakataka king Harisena between 460 and 478 A profuse variety of decorative sculpture, intricately carved columns and carved reliefs are found, including exquisitely carved cornices and pilaster. Skilled artisans crafted living rock to imitate timbered wood (such as lintels) in construction and grain and intricate decorative carving, although such architectural elements were ornamental and not functional in the classical sense.^[31]

Later many Hindu kings from southern India patronize many cave temples dedicated to Hindu gods and goddesses. One such prominent example of cave temple architecture are the Badami Cave Temples at Badami, the early Chalukya capital, carved out in the 6th century. There are four cave temples hewn from the sides of cliffs, three Hindu and one Jain, that contain carved architectural elements such as decorative pillars and brackets as well as finely carved sculpture and richly etched ceiling panels. Nearby are many small Buddhist cave shrines. at Bhinmal (850–950 CE) took place.

Final wave of cave construction (6th–15th century CE)

At Ellora, on the hill to the northeast of the main complex of caves, is a Jain cave temple containing a 16-foot (4.9 m) rock-carved image of Lord Parshvanath with an inscription dated 1234/5 CE. This well preserved image is flanked by Dharaṇendra and Padmavati, is still under active worship. The inscription mentions the site as Charana Hill, a holy site. This was the last excavation at Ellora. The Ankai Fort caves are thought to be from the same period.

The final wave of Indian rock-cut cave construction occurred at Gwalior with five clusters of rock-cut monuments surrounding the Gwalior fort, two centuries after the Ellora Parshvantha cave temple. They contain many monumental Jain images.

South-West Group: Now termed Trishalagiri.^[37] The group is the first one encountered when driving to the Urvai Gate, just outside the fortifications. There are the oldest Jain monuments in Gwalior from the post-Gupta period. Archaeologist L.B. Singh dates them to 6th to 8th cent AD. The Pallava architects started the carving of rock for the creation of monolithic copies of structural temples. A feature of the rock-cut cave temple distribution until the time of the

early Pallavas is that they did not move further south than Arakandanallur, with the solitary exception of Tiruchitrapalli on the south bank of the Kaveri River, the traditional southern boundary between north and south. Also, good granite exposures for rock-cut structures were generally not available south of the river.

Modality of carving: A rock cut temple is carved from a large rock and excavated and cut to imitate a wooden or masonry temple with wall decorations and works of art. Pancha Rathas is an example of monolith Indian rock cut architecture dating from the late 7th century located at Mamallapuram, a UNESCO World Heritage Site.

Ellora cave temple 16, the Kailash Temple, is singular in that it was excavated from the top down rather than by the usual practice of carving into the scarp of a hillside. The Kailash Temple was created through a single, huge top-down excavation 100 feet deep down into the volcanic basaltic cliff rock. It was commissioned in the 8th century by King Krishna I and took more than 100 years to complete. The Kailash Temple, or cave 16 as it is known at Ellora Caves located at Maharashtra on the Deccan Plateau, is a huge monolithic temple dedicated to Lord Shiva. There are 34 caves built at this site, but the other 33 caves, Hindu, Buddhist, and Jain, were carved into the side of the plateau rock. The effect of the Kailash Temple is that of a free-standing temple surrounded by smaller cave shrines carved out of the same black rock. The Kailash Temple is carved with figures of gods and goddesses from the Hindu Puranas, along with mystical beings like the heavenly nymphs and musicians and figures of good fortune and fertility. Ellora Caves is also a World Heritage Site,

Free Standing Rock temples: There is no timeline that divides the creation of rock-cut temples and free-standing temples built with cut stone as they developed in parallel. The building of free-standing structures, especially Buddhist temples, began in the 3rd century BCE, whereas Hindu temples started to be built from the 5th century CE. Meanwhile, rock cut temples continued to be excavated until the 12th century.



A

The *Descent of the Ganges*, also known as *Arjuna's Penance*, at Mamallapuram, is one of the largest rock reliefs in Asia and features in several Hindu myths.

In India, caves have long been regarded as sacred places. Caves that were enlarged or entirely man-made were believed to be as sacred as natural caves. The sanctuary in all Indian religious structures, even free-standing ones, was designed to have the same cave-like feeling, as it is

generally small and dark, without natural light. The oldest rock-cut architecture is found in the Barabar caves, Bihar, which were built around the 3rd century BC. Other early cave temples are found in the western Deccan; these are mostly Buddhist shrines and monasteries, dating between 100 BC and 170 AD. Originally, there were probably wooden structures associated with them, which would have deteriorated over time.

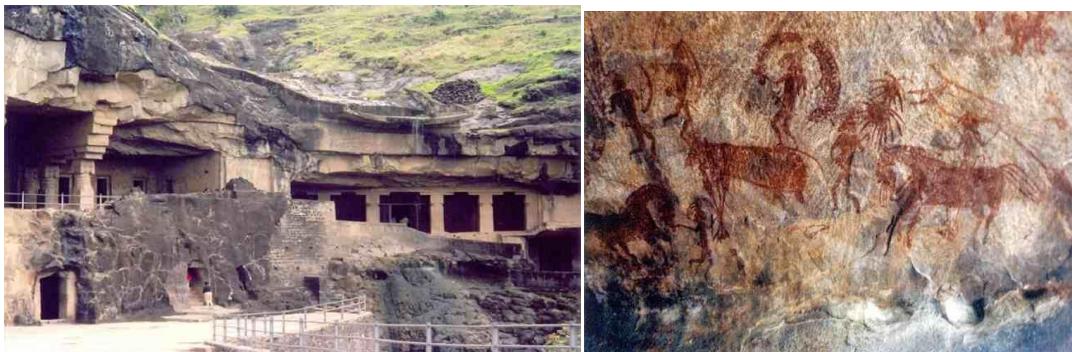
Historically, artisans carried forward design elements from wood in their rock-cut temples: skilled craftsmen carved rock to imitate timber texture, grain, and structure. The earliest cave temples include the Bhaja Caves, the Karla Caves, the Bedse Caves, the Kanheri Caves, and some of the Ajanta Caves. Relics found in these caves suggest a connection between the religious and the commercial. Buddhist missionaries are known to have accompanied traders on the busy international trading routes through India. Some of the more sumptuous cave temples, commissioned by wealthy traders, included pillars, arches, and elaborate facades. They were made during the period when maritime trade boomed between the Roman Empire and south-east Asia.

Although free-standing structural temples were being built by the 5th century, rock-cut cave temples continued to be built in parallel. Later rock-cut cave architecture became more sophisticated, as in the Ellora Caves. The monolithic Kailash Temple is considered to be the peak of this type construction. Although cave temples continued to be built until the 12th century, rock-cut architecture became almost totally structural in nature. That is, rocks were cut into bricks and used to build free-standing structures. Kailash was the last spectacular rock-cut excavated temple.^[7] Numerous rock reliefs, relief sculptures carved into rock faces, have been found outside caves or at other sites. New discoveries of relatively small rock-cut sites, mostly Buddhist, continue to be made in the 21st century, especially in the Deccan.

Water bodies: "The temple architecture is simply not a representation of the skill of the architect or a craftsman, but it is the realization and culmination of the religious concept. It is an embodiment of devotion which inspire their existence in a visible form. In ancient times, religious considerations were not only behind the forms and structure of temple, but also the aesthetic idioms at particular point of time when they were commissioned. T. V. Sairam has aptly said "They are the symbols of art and religion" 1 . The architecture of any region has influences of its geographical position, climate, social-political conditions and other related factors. In ancient India, the water bodies were the hubs for the settlements of human civilization. For example, the Indus Civilization had its maximum settlements alongside the rivers or other water bodies.¹ " Water bodies have been mentioned as an important component of town planning in the Vastushastra³ text of India, and also been mentioned in the Arthashastra⁴ of Kautilya and Smaranganasutradhara⁵ of King Bhoja. Being situated near the water bodies, clay was the easily available material in Gangetic plains⁶ . Also along with the clay, in forested region, wood played an important role of useful construction material. Here, not only the wood but sometimes different species of grass, reed bamboo were also frequently used. The availability of local building material was the obvious choice to be used for construction. For instance, trap in Deccan and granite were used in the region of south around Halebid⁸ . Besides, the topographical features such as mountains, hills, ravines provided opportunities to experiment different artistic skills. Certainly, due to these experimentation, we find rock-cut activities in region naturally blessed with hills . The setting up of sacred spaces such as tumuli, hut, temples, groves and enclosures has been a characteristic feature in the religious movements throughout

history of the world. All such temple structures have remained the expressions of deeply ingrained religious sentiments and spiritual values. Due to popularity Buddhism and Jainism sects, Brahmanical lineage had to struggle for some time when these sects were prominently patronized by the royal court. There was a gradual change in mode of worship. Transformations in the religious order were also accepted by the masses due to the over-burdened rituals and the rigid low-caste status. The kingdom itself protected the Buddhist monasteries, where trader got shelter and sometimes, probably deposited their money. Gradually, it created a vast network among the traders of India and outside. The chaityas and viharas began to flourish along with the ancient trade routes also known as „Silk Route“.

Examples of Complex Rock-Cut Architecture complexes



The Rock-cut structures present the most spectacular piece of ancient Indian art specimen. Most of these rock-cut structures are closely associated with various religions and religious activities. In the beginning, remarkable Buddhist and Jain rock-cut structures were built in areas such as Bihar in the east and Maharashtra in the west. Numerous caves were excavated by the Buddhist monks for prayer and residence purposes. The best example of this is Chaityas (prayer halls) and viharas (monasteries). Inside these rock-cut structures, windows and balconies and gates were carved as huge arch shaped openings.



Rock-cut architecture occupies a very important place in the history of Indian Architecture. The rock-cut architecture differs from traditional buildings in many ways. The rock-cut art is more similar to sculpture than architecture as structures were produced by cutting out solid rocks. Let's have a look at various specimen of rock-cut architecture in ancient India. Some prominent rock-cut structures of ancient India are Chaityas, Viharas, temples etc.



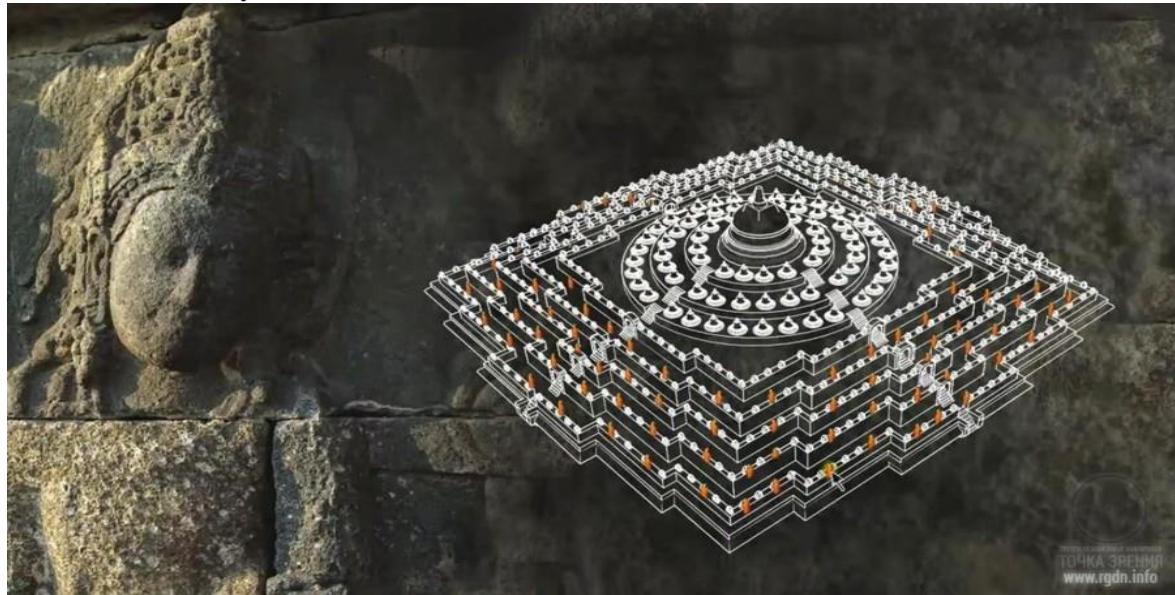
Architectural analytics is the field of study that focuses on the discovery and identification of meaningful patterns in architecture.

Architecture represents a snapshot in time and can, in a very detailed fashion, animate the civilisation and people that created it. Architectural analytics can allow a large amount of information about a monument, settlement or civilisation to be discerned. This ability to inform and present previously unknown facts makes architectural analytics important in piecing together the larger understanding of civilisations and the human story.

Chapter 8

The Borobodur Temple as a SQUARE GRID MANDALA

Empires such as Bagan, Ayutthaya, Champa, Khmer, Srivijaya and Majapahit are known as "mandala" in this sense. Our temple is the second largest Buddhist temple in the world after Angkor Wat. Constructors erected this monument in the shape of a mandala and an opening Lotus flower on a square base (118 x 118 m) that smoothly turns into a circle.¹



MANDALA AND HINDU TEMPLE ARCHITECTURE

Although there have been various arguments by authors of Indian temple architecture like Stella Kramrisch and Michael W. Meister about the applicability of the Vastu Purusha Mandala as a governing device for temple architecture, it is safe to say that for formulating the layout of the temple, the Vastu Purusha Mandala has been an imperative tool. Though the 8 x 8 grid or the Manduka Vastu Mandala has been used in various temples of Indian architecture, it is to be noted that regional differences have played a major influence on the workability of the mandala design throughout India. Customarily, mandalas were spaces for the symbolic consciousness of universal theories which help in the awakening of the individual psyche. The mandalas can be thought of as diagrams that function as a cue to reach a contemplational state which is the primary aim of the tradition. The form of the temples that are based on the regulating lines of the mandala were meant to create spaces that bring about a "physical and spatial" communion between God and man.

A **mandala** (emphasis on first syllable; Sanskrit मण्डल, *maṇḍala* – literally "circle") is a geometric configuration of symbols with a very different application. In various spiritual traditions, mandalas may be employed for focusing attention of practitioners and adepts, as a spiritual guidance tool, for establishing a sacred space and as an aid to meditation and trance induction. It is used as a map (in Shintoism) in the Indian religions of Hinduism, Buddhism, Jainism or Japanese religion of Shintoism representing deities, or in the case of Shintoism, paradises, kami or actual shrines.

In New Age, the mandala is a diagram, chart or geometric pattern that represents the cosmos metaphysically or symbolically; a time-microcosm of the universe, but it originally meant to represent wholeness and a model for the organizational structure of life itself, a cosmic diagram that shows the relation to the infinite and the world that extends beyond and within minds and bodies.

The basic form of hinduism mandalas is a square with four gates containing a circle with a center point and it is called also a yantra. Each gate is in the general shape of a T. Mandalas often have radial balance.

A yantra is similar to a mandala, usually smaller and using a more limited colour palette. It may be a two- or three-dimensional geometric composition used in sadhanas, puja or meditative rituals, and may incorporate a mantra into its design. It is considered to represent the abode of the deity. Each yantra is unique and calls the deity into the presence of the practitioner through the elaborate symbolic geometric designs. According to one scholar, "Yantras function as revelatory symbols of cosmic truths and as instructional charts of the spiritual aspect of human experience"^[5]

Many situate yantras as central focus points for Hindu tantric practice. Yantras are not representations, but are lived, experiential, nondual realities. As Khanna describes:

Despite its cosmic meanings a yantra is a reality lived. Because of the relationship that exists in the Tantras between the outer world (the macrocosm) and man's inner world (the microcosm), every symbol in a yantra is ambivalently resonant in inner–outer synthesis, and is associated with the subtle body and aspects of human consciousness.



Political meaning

The Rajamandala (or Raja-mandala; circle of states) was formulated by the Indian author Kautilya in his work on politics, the Arthashastra (written between 4th century BCE and 2nd century BCE). It describes circles of friendly and enemy states surrounding the king's state.

In historical, social and political sense, the term "mandala" is also employed to denote traditional Southeast Asian political formations (such as federation of kingdoms or vassalized states). It was adopted by 20th century Western historians from ancient Indian political discourse as a means of avoiding the term 'state' in the conventional sense. Not only did Southeast Asian polities not conform to Chinese and European views of a territorially defined state with fixed borders and a bureaucratic apparatus, but they diverged considerably in the opposite direction: the polity was defined by its centre rather than its boundaries, and it could be composed of numerous other tributary polities without undergoing administrative integration.

Mount Meru

A mandala can also represent the entire universe, which is traditionally depicted with Mount Meru as the axis mundi in the center, surrounded by the continents.

Wisdom and impermanence

In the mandala, the outer circle of fire usually symbolises wisdom. The ring of eight charnel grounds represents the Buddhist exhortation to be always mindful of death, and the impermanence with which samsara is suffused: "such locations were utilized in order to confront and to realize the transient nature of life". Described elsewhere: "within a flaming rainbow nimbus and encircled by a black ring of dorjes, the major outer ring depicts the eight great charnel grounds, to emphasize the dangerous nature of human life". Inside these rings lie the walls of the mandala palace itself, specifically a place populated by deities and Buddhas.

Five Buddhas

One well-known type of mandala is the mandala of the "Five Buddhas", archetypal Buddha forms embodying various aspects of enlightenment. Such Buddhas are depicted depending on the school of Buddhism, and even the specific purpose of the mandala. A common mandala of this type is that of the Five Wisdom Buddhas (a.k.a. Five Jinas), the

1. Buddhas Vairocana,
2. Aksobhya,
3. Ratnasambhava,
4. Amitabha and
5. Amoghasiddhi.

When paired with another mandala depicting the Five Wisdom Kings, this forms the Mandala of the Two Realms.

Borobudur has eight tiers: the five lower ones are square, whereas the three upper ones are round. The shape of the building itself resembles a mandala and represents a scheme of the universe according to Buddhist beliefs, where heaven and earth are united. On the upper tier there are 72 small stupas around a big central stupa. Every stupa is bell-shaped. Inside the stupas, there are Buddha statues.

The temple complex contains 1,460 bas-reliefs with religious motifs. Relief panels describe the world of passions and the world of human perceptual development. Gradually ascending the helical serpentine road, a traveller perceives the world of matter and reaches the spiritual world.

The temple structure may be divided into three components:

- the temple base,
- the temple summit.
- the temple body,

The temple base is 118 x 118 m in width and 4 m in height. It is made of smooth plates with three tiers and 20 corners. The temple body consists of five square platforms-tiers: the higher one ascends the smaller every next tier is. The very first platform of the "monument body" is located 7 metres away from the edge of the base. Every subsequent platform is shifted 2 metres relative to the previous platform. The temple summit consists of three rounded platforms, on which 72 small stupas and the main stupa in the centre are installed. The central stupa is the highest point of the monument, towering 35 metres above the temple foot. It represents a bell-shaped stupa, 7 metres in height, topping the huge pyramid.

1.The lowest level of the temple complex, called Kamadhatu, represents the world of passions. 160 images of sensory manifestations have not been preserved to nowadays – we know about the existence of those from ancient manuscripts only.

2.The second level – the five tiers called Rupadhatu – symbolizes the real world and contains religious themes. The entire history of Buddhism is reflected in sculptures and bas-reliefs. Here, there are 432 Buddha statues: 104 on the first and second terraces (each), 88 on the third terrace, 72 on the fourth, and 64 on the fifth.

3.The remarkable beauty is completed by the three upper rounded terraces. This is the Arupadhatu level. There are 32 stupas on the lowest terrace, 24 on the middle, and 16 on the upper. A natural-sized statue of Buddha is inside each of the stupas. The largest stupa – the symbol of eternity – finishes the building.

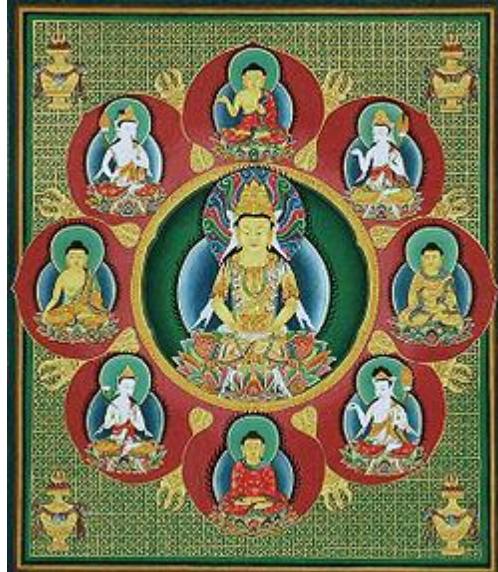
$32+24+16 = 72$: an interesting interpretation of the structure of the world.

10 th: The most interesting is the secret of the “tenth terrace”. It was discovered totally accidentally that bas-reliefs are carved under the ground on Borobudur base walls, just like on the six lower terraces of the stupa. About 1,500 square metres of valuable bas-reliefs have turned to be hidden under the ground. The lower tier of the bas-relief describes the afterlife, and we can assume this was the reason why human eyes were not supposed to see it. An enormous piece of work was deliberately concealed from people, since only all-seeing deities could admire the bas-reliefs. There is an assumption that Borobudur was constructed in a shape of Buddha sitting on a Lotus flower. In 1949 geologists discovered deposits that were interpreted as the bottom of a lake. There is a probability that the temple complex was located on a lake. By the constructors’ plan, the entire magnificence of the temple was above the lake surface, and Buddha statue crowned the entire structure. Buddhist monks who were building Borobudur implemented the idea of “a bible in stone”, having left the knowledge to descendants for many centuries. Images on the walls told about Buddha’s life. Following the way along the galleries, a person approached enlightenment. In order to read this textbook in stone, one needed to cover almost 5 km. Visitors covered the way to the very top of the temple, moving clockwise through all the eight tiers. Every platform represents a stage of education on the way of transition from the earthly plane to the heavenly plane.²

Biggest Mandala in the world

Borobudur is biggest Mandala in the world, when You see from sky You can see the Mandala, if You see further, You can see 3 Temple in one straight line (Mendut Temple, Pawon Temple and Borobudur Temple) between that, there is Elo river and Progo river and it was built at 8th century

Thus, most likely the architecture of the Borobudur is based on a Javanese variant of Buddhism, for if we look at the decoration in greater detail we obviously can confirm that its origin is based on Indian mythology and Buddhist iconography, however, we can also clearly see how these fundamental elements have been strongly combined with local (that is, Javanese) influences. The style in which the characters are depicted on the Borobudur differ greatly from the traditional Indian (Buddhist) iconography. The statues are depicted in other bodily postures, and with less refined details as they have in India; the Javanese obviously had a different idea of physical beauty and how this ought to be depicted, and that’s why on the Borobudur the voluptuous curves of the body as familiar in Indian iconography are altered according to local Javanese perception of beauty (by which the female body is dressed in more clothes, and often can only be distinguished from the male body by the curves of their breasts).



If we consider the assumption of the Borobudur representing a *mandala*, then the main *stūpa* signifies the final destination of the spiritual path, which is situated in the center of the cosmos. At this point one

becomes united with the five transcendental Buddhas of the Formless Realm: Vairocana in the center, Akṣobhya in the East, Ratnasambhāva in the South, Amitābha in the West, and Amoghasiddhi in the North. This particular line-up corresponds with the *Vajradhātu Maṇḍala* and the *Garbhadhātu Maṇḍala* in Tibet and Nepal. One could gain access to the center of the cosmos by entering the *maṇḍala* from the outside, and gradually moving further inwards. In this context, a *maṇḍala* can be interpreted as a palace with four entrance gates at the four cardinal points of the Universe, stretching the entire cosmos. The palace is a metaphor for human manifestation in this world, which, by means of using the *maṇḍala* as a meditation object, guides the practitioner to the ultimate (spiritual) goal in life. Visualization techniques such as these are still being practised in Vajrayāna Buddhism today.

Though the assumption of the Borobudur as a *mandala* seems possible, this view remains yet impossible to prove. In spite of the previously mentioned similarities with the *maṇḍalas*, there are, however, also many differences. Beside the five transcendental Buddhas many other deities – both male and female – are often seen depicted in *maṇḍalas*. However, neither of these deities can be found on the Borobudur. Instead we do find many other depicted Buddhas on the Borobudur, but these do not display any of the features similar to other male or female deities. Thus, the other Buddhas do not function as a mere substitution for the various other deities (like guards, gatekeepers, goddesses of worship or Taras) commonly seen in *maṇḍalas*. Therefore, we may assume, that, as already had been suggested, the Borobudur displays a variant of Buddhism in the way it manifested in Java at the time of the reign of the Sailendra dynasty. This particular local variant of Buddhism was based on Indian influences and Mahāyāna Buddhism, which came to Java from China during the heydays of the Tang dynasty (618–906). The unique combination of these aspects would eventually become the Buddhism of Java. Then there also was the Hindu dynasty of Sanjaya that ruled on Java during the same period of the Sailendra dynasty. The fact that the Sanjaya shared their power with the Sailendra dynasty – for example, through donations for the construction of the Kalasan temple – illustrates, that, apart from its religious function, the Borobudur also formed an important expression of power.³

The role of royal patronage and religious institution⁴

The Borobudur monument combines the symbolic forms of the stupa (a Buddhist commemorative mound usually containing holy relics), the temple mountain (based on Mount Meru of Hindu mythology), and the mandala (a mystic Buddhist symbol of the universe, combining the square as earth and the circle as heaven). The style of Borobudur was influenced by Indian Gupta and post-Gupta art. In all the regions of Southeast Asia, the arts flourished under the patronage of the kings. About the time of the birth of Christ, tribal groups gradually organized themselves, after some years of settled life as rice cultivators, into city-kingdoms, or conglomerations of villages. A king was thus little more than a paramount tribal chieftain. Since the tribes had been accustomed to worshiping local spirits, the kings sought a new spirit that would be worshiped by the whole community.

One reason that the gods of Hinduism and Buddhism were so readily acceptable to Southeast Asia was this need for new national gods. The propagation of the new religions was the task of the kings, and consequently the period from the 1st to the 13th century was a great age of temple building all over Southeast Asia.

Architecture, sculpture, and painting on the temple walls were the arts that flourished. In the ancient empires of eastern Indochina and the islands, scholars of Sanskrit, the language of the sacred works of Hinduism, became part of the king's court, producing a local Sanskrit literature of their own. This literary activity was confined to the hereditary nobility and never reached the people, except in stories from the great Hindu epics *Mahabharata* and *Ramayana*. Because the Hindu religious writings in Sanskrit were beyond the reach of the common people, Hinduism had to be explained to them by Hindu stories of gods and demons and mighty men. On the other side of the peninsula, in the Pyu-Burmese empire of Prome,

which flourished before the 8th century, there was no such development—first, because Hinduism was never widely accepted in Burma and, second, because the more open Burmese society developed neither the institution of a god-king nor that of a hereditary nobility. Although Pali scholars surrounded the king in later Pagan, Pali studies were pursued not at the court but at monasteries throughout the kingdom so that even the humblest villager had some faint contact with Pali teachings. While the courts of the kings in Cambodia and Java remained merely local centres of Sanskrit scholarship, Pagan became a centre of Pali learning for Buddhist monks and scholars even from other lands. As in the case of stories from the Indian epics, stories of the Jatakas (birth stories of the Buddha) were used to explain Buddhism to the common people, who could not read the scriptures written in Pali. Just as scenes from the great epics in carving or in fresco adorned the temples in Cambodia and Java, scenes from the *Jatakas* adorned the Pagan temples.

The patronage of the king and the religious enthusiasm of the common people could not have produced the great temples without the enormous wealth that suddenly became available in the region following the commercial expansion. With the Khmer and Javanese empires, the wealth was produced by a feudalistic society, and so the temples were built by the riches of the king and his nobles, combined with the compulsory labour of their peasants and slaves, who probably derived some aesthetic pleasure from their work because of their religious fervour. Nonetheless, their monuments, such as Borobudur, in Java, and Angkor Wat, in Cambodia, had an atmosphere of massive, all-conquering power. At Pagan, where wealth was shared by the king, the royal officials, and the common people, the temples and the monasteries were built by all who had enough not only to pay the artisans their wages but also to guarantee their good health, comfort, and safety during the actual construction. The temples were dedicated for use by all monks and lay people as places of worship, meditation, and study, and the kings of Pagan did not build a single tomb for themselves. The Khmer temple of Angkor Wat and the Indonesian temple of Borobudur were tombs in that the ashes of the builders would be enshrined therein; the kings left stone statues representing them as gods for posterity to worship, whereas at Pagan there was only one statue of a king, and it depicted him on his knees with his hands raised in supplication to the Buddha. Consequently, the atmosphere that pervaded the temples of Pagan was one of joy and tranquillity.

The mandala is likened by some to a "floor plan of the universe." The type most familiar in the West is an intricately patterned painting on cloth or paper that often takes the general form of a circle within a square.

The word "mandala" comes from the Sanskrit verbal root "mand" (meaning to mark off, decorate, set off) and the Sanskrit suffix "la" (meaning circle, essence, sacred center).

The mandala's symbolic power can be traced back to millennia-old roots in Indian temple architecture, which created sacred spaces linking the worshiper to the larger cosmos. In these temples, time and space were represented in a vocabulary of circles and squares. Similarly, a mandala helps believers visualize the universe and their place in it, often in relation to a specific deity found in the center of the image.

the evolution of the symbol has happened throughout Asia under the influence of various religious and artistic traditions over a period of several thousand years—some complex; others quite simple offering proof of the continuing vitality of the mandala and its role in Buddhist devotions. The mandala is of significant importance in both Hinduism and Buddhism. Both religions adopt the mandala as a peaceful and creative symbol. Hence, the speculative project finds a balance to build a memorial, which will signify peace and harmony of the Tamil community. The scale of the mandala here is monumental imposing the idea of spirituality and peace. Contemplating the mandala does not only provide insight into reality, the Cosmos but also communion with it.

Mandala is the mystery that pervades all existence. Mandala alleviates suffering individually as well as in society. Contemplation can help overcome antagonism, conflict, stress and even war. Bindu as a symbolism is the beginning of the process that culminates into a mandala.

In Buddhism, the mandala is a ritual instrument, much like a mantra, used to assist meditation and concentration. Throughout history, these pictorial temples--intricate, two-dimensional, multi-colored patterns of concentric circles, squares, and other shapes--have signified the human need for wholeness, order, and balance. But while many people of the West accept mandalas as representative of a cosmic force, few understand they are meant to be blueprints as well. Indeed, a Tantric Buddhist meditator studies a two-dimensional mandala like an architect, building up in his mind the image of a palace encompassing the sacred principles of Buddhist philosophy.

MANDALA AND BUDDHIST TEMPLE ARCHITECTURE

The mandala in Buddhism is a cosmic model depicting Buddha's dwelling place as the center of the universe. Like in the Hindu temples, the structuring of the Buddhist temples has also been predominantly based on the spiritual model of the mandala. Illustrations can be seen both in the form of two-dimensional mandalas as well as three-dimensional mandalas. The two-dimensional mandalas which are drawings composed of squares and concentric circles could be temporarily painted on various material or drawn on the ground or sand or other natural substances using coloured powder. Customs involving ceremonious gatherings along with prayers and chantings while drawing the mandalas are believed to alleviate difficulties and be of greater good to an individual or a community. These ceremonies could even last up to a number of days.

Three-dimensionally, the mandala diagram becomes a visual model of the built environment. In the Buddhist worship place, the central space is significant having a statue of the Buddha fronted by a worshipping space surrounded by walls. This is encircled by a circumambulating space. The circumambulation pathway is a space of psychological awakening before reaching the spiritual pinnacle

Practice

Mandalas are commonly used by tantric Buddhists as an aid to meditation.

The mandala is "a support for the meditating person", something to be repeatedly contemplated to the point of saturation, such that the image of the mandala becomes fully internalised in even the minutest detail and can then be summoned and contemplated at will as a clear and vivid visualized image. With every mandala comes what Tucci calls "its associated liturgy ... contained in texts known as tantras" instructing practitioners on how the mandala should be drawn, built and visualised, and indicating the mantras to be recited during its ritual use.

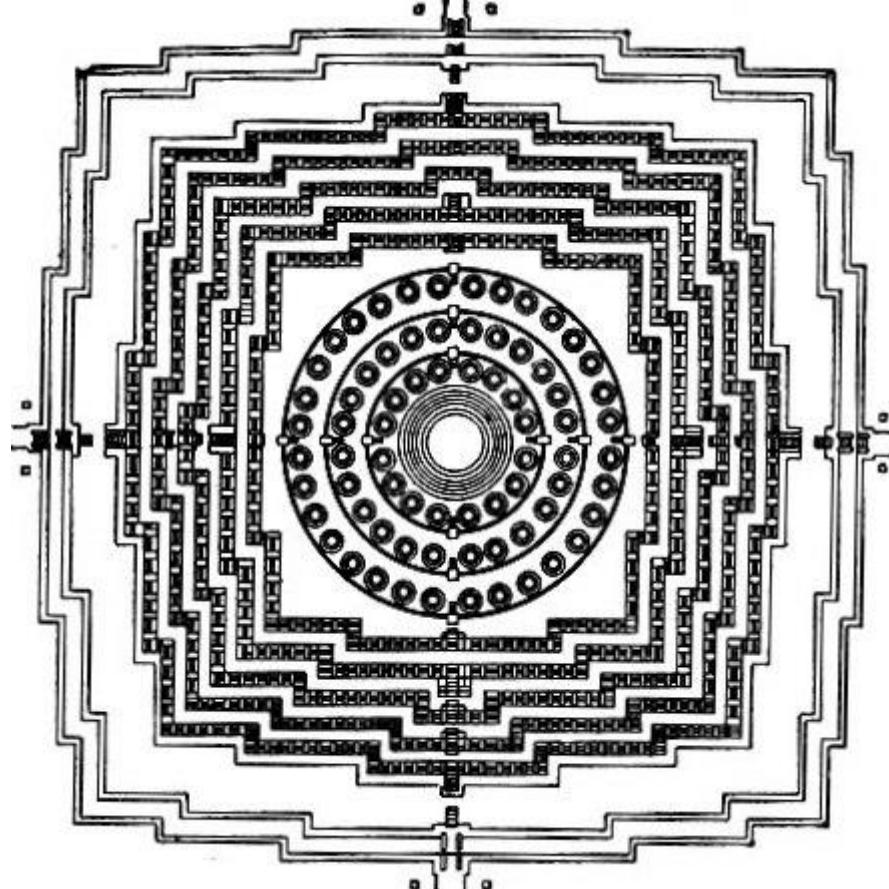
By visualizing "pure lands", one learns to understand experience itself as pure, and as the abode of enlightenment. The protection that we need, in this view, is from our own minds, as much as from external sources of confusion. In many tantric mandalas, this aspect of separation and protection from the outer samsaric world is depicted by "the four outer circles: the purifying fire of wisdom, the vajra circle, the circle with the eight tombs, the lotus circle". The ring of vajras forms a connected fence-like arrangement running around the perimeter of the outer mandala circle.

As a meditation on impermanence (a central teaching of Buddhism), after days or weeks of creating the intricate pattern of a sand mandala, the sand is brushed together into a pile and spilled into a body of running water to spread the blessings of the mandala. External ritual and internal sadhana form an indistinguishable whole, and this unity finds its most pregnant expression in the form of the mandala, the sacred enclosure consisting of concentric squares and circles drawn on the ground and representing that adamant plane of being on which the aspirant to Buddha hood wishes to establish himself. The unfolding of the tantric ritual depends on the mandala; and where a material mandala is not employed, the adept proceeds to construct one mentally in the course of his meditation."

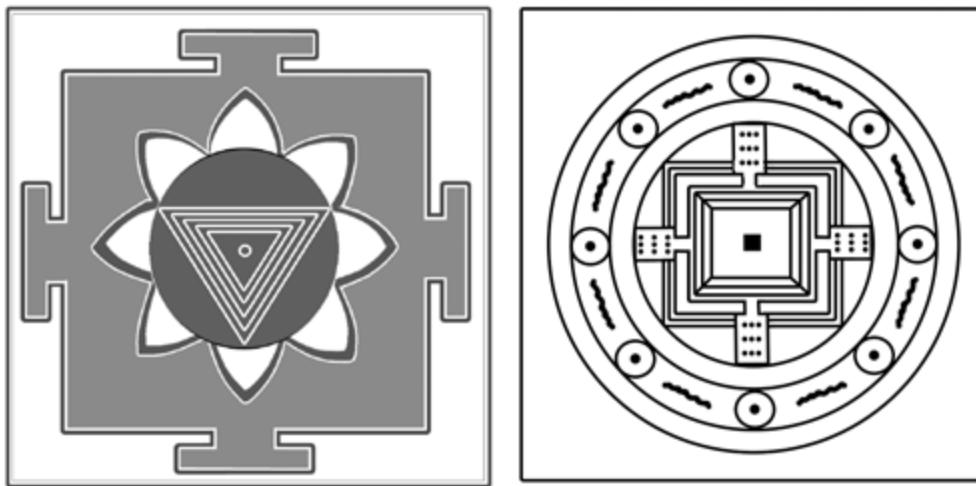
Conclusions:

1. Borobudur in its base is a regular square with 118-m sides.
2. Such layout is used in meditative practices of Hinduism and Buddhism to intensify processes of inner concentration during meditation.
3. The numbers 7, 72. were applied in the temple design and construction, which evidences the availability of relevant knowledge at that time.

4. No wonder, the temple complex is under UNESCO protection, i.e. it is not available for further studies.
5. If we look at Borobudur from above, we can see it represents a complete mandala.



6. The temple has 8 tiers: 5 square and 3 round ones. On the upper tier, there is the large stupa – a bell-shaped monument with a statue of Buddha inside.
7. Borobudur is situated approximately 2,439.85 km (1,516.05 miles) away from Angkor Wat.
8. If we look at mutual disposition of some ancient religious sites from the North Pole, interesting correlations may be observed.
9. At the upper tier there are 72 small bell-shaped, stupa-like towers located around the big central tower.
10. Between Chandi Mendut and Borobudur there is the small Chandi Pavon – at a distance of approximately 1,150 metres away from Mendut and 1,750 metres away from Borobudur. Disposition of the structures complies with the golden ratio.



A mandala and a yantra

11. Mandala in the form of a circle with an indication of a square and a point in the centre, and a four-sided pyramid with six steps and fourfold division;
12. Kali Yantra (translated from Sanskrit, “kala” means “time”; this word originates from the Indo-European root that means spinning; a word that is close in its meaning in Russian is “kolo”); in Hindu mythology it means cyclical creations and destructions of the Universe, rotation of time in the concept of rebirth of the Soul and of a subject of fate.

REFERENCE

1. https://rgdn.info/en/borobodur_buddhiska_stupa
2. See Chapter
- 3<https://www.indomagic.com/articles/art-material-culture/architecture/architecture-of-borobudur-temple/>
4. <https://www.britannica.com/art/Southeast-Asian-arts/Indigenous-traditions>

Chapter 9

Hinduism Mount Meru & S.E. Asian Art

Mount Meru, in Hindu mythology, a golden mountain that stands in the centre of the universe and is the axis of the world. It is the abode of gods, and its foothills are the Himalayas, to the south of which extends Bhāratavarṣa ("Land of the Sons of Bharata"), the ancient name for India. The roof tower crowning the shrine in a Hindu temple represents Meru. As the world axis, Mount Meru reaches down below the ground, into the nether regions, as far as it extends into the heavens. All of the principal deities have their own celestial kingdoms on or near it, where their devotees reside with them after death, while awaiting their next reincarnation.]

GEOGRAPHY; The dimensions attributed to Mount Meru — which all refer to it as a part of the Cosmic Ocean, along with several other statements that describe it in geographically vague terms (e.g., "the Sun along with all the planets circle the mountain") — make the determination of its location most difficult, according to most scholars.

Some researchers identify Mount Meru or Sumeru with the Pamirs, northwest of Kashmir.

The Suryasiddhanta mentions that Mt. Meru lies in *the middle of the Earth* ("bhūva-madhyā") in the land of the Jambunad (Jampudvīpa). *Narapatijayacharyasvarodaya*, a ninth-century text, based on mostly unpublished texts of Yāmal Tantr, mentions:

"Sumeruh Prithvī-madhye shrūyate drishyate na tu"
(Su-meru is heard to be in the middle of the Earth, but is not seen there).

Several versions of cosmology can be found in existing Hindu texts. In one of them, cosmologically, the Meru mountain was also described as being surrounded by Mandrachala Mountain to the east, Suparshva Mountain to the west, Kumuda Mountain to the north and Kailasa to the south

Main articles: Buddhist cosmology and Mount Meru (Buddhism)



Yuan dynasty (1271–1368) Chinese mandala depicting Mount Meru as an inverted pyramid topped by a lotus.

According to Buddhist cosmology, Mount Meru (or Sumeru) is at the centre of the world, and Jambūdvīpa is south of it. It is 80,000 yojanas wide and 80,000 yojanas high according to the *Abhidharmaśabdhāśyam* and 84,000 yojanas high according to the *Long Āgama Sutra*. Trāyastriṃśa is on its peak, where Śakra resides. The Sun and the Moon revolve around Mount Meru, and as the Sun passes behind it, it becomes nighttime. The mountain has four faces — each one made of a different material; the northern face is made of gold, the eastern one is made of crystal, the southern one is made of lapis lazuli, and the western one is made of ruby.

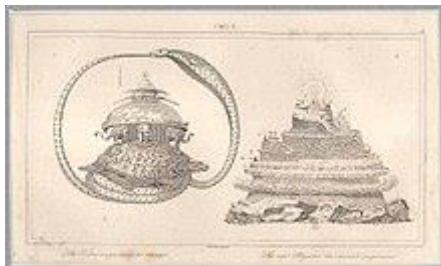
In Vajrayāna, mandala offerings often include Mount Meru, as they in part represent the entire universe. It is also believed that Mount Meru is the home of the buddha Cakrasaṃvara.



Tibetan Cakrasaṃvara sand mandala with Mount Meru in the centre.
/ Tibetan Buddhist embroidery representing Mount Sumeru.



Hindu cosmology



The cosmic tortoise, and Mount Meru

Mount Meru of Hindu traditions is described as 84,000 yojanas high, about 1,082,000 km (672,000 mi), which would be 85 times the Earth's diameter. The Sun, along with all the planets in the Solar System, revolve around Mt. Meru as one unit.

One yojana can be taken to mean about 11.5 km (9 miles), though its magnitude seems to differ over time periods — e.g., the Earth's circumference is 3,200 yojanas according to Varahamihira and slightly less so in the Aryabhatiya, but is said to be 5,026.5 yojanas in the Suryasiddhānta. The Matsya Purana and the Bhagvata Purana, along with some other Hindu texts, consistently give the height of 84,000 yojanas to Mount Meru, which translates into 672,000 miles or 1,082,000 kilometers.

Mount Meru was said to be the residence of King Padamja Brahma in antiquity.

According to Charles Allen, Mount Kailash is identified with Mount Meru. One description in the Vishnu Purana of the mountain states that its four faces are made of crystal, ruby, gold, and lapis lazuli.^[23] It is a

pillar of the world and is located at the heart of six mountain ranges symbolizing a lotus.^[23]



Painting of Mount Meru from Jain cosmology from the *Samghayanarayana*

Jain cosmology

According to Jain cosmology, Mount Meru (or *Sumeru*) is at the centre of the world surrounded by Jambūdvīpa, in form of a circle forming a diameter of 100,000 yojans. There are two sets of sun, moon and stars revolving around Mount Meru; while one set works, the other set rests behind Mount Meru.

Every Tirthankara is taken to the summit of Meru by Indra shortly after his birth, after putting the Tirthankara child's mother into deep slumber. There, he was bathed and anointed with precious unctions. Indra and other Devas celebrated his birth.

Javanese Legends: This mythical mountain of gods was mentioned in the Tantu Pagelaran, an Old Javanese manuscript written in the 15th-century Majapahit period. The manuscript describes the mythical origin of the island of Java, as well as the legendary movement of portions of Mount Meru to Java. The manuscript explains that Batara Guru (Shiva) ordered the gods Brahma and Vishnu to fill Java with human beings. However, at that time, Java island was floating freely on the ocean, always tumbling and shaking. To stop the island's movement, the gods decided to nail it to the Earth by moving the part of Mahameru in Jambudvipa (India) and attaching it to Java. The resulting mountain is Mount Semeru, the tallest mountain on Java.

Mount Semeru, a large active volcano on Java, is named after the mount.



The five central towers of Angkor Wat, before a Hindu and later a Buddhist temple in Siem Reap, Cambodia, symbolize the peaks of Mount Meru.

The concept of a holy mountain surrounded by various circles was incorporated into ancient Hindu temple architecture with a *Shikhara* (*Śikhara*) — a Sanskrit word translating literally to "mountain peak." Early examples of this style can be found at the Harshat Mata Temple and Harshnath Temple from the 8th century CE in Rajasthan, Western India. This concept also continued outside India, such as in Bali, where temples feature Meru towers.

In Buddhist temples, the Mahabodhi Temple in Bodh Gaya is the earliest example of the 5th- to 6th-century depiction. Many other Buddhist temples took on this form, such as the Wat Arun in Thailand and the Hsinbyume Pagoda in Myanmar.



1. *Prang* of Wat Phutthaisawan, a Buddhist temple in Samphao Lom, Thailand, representing Mount Meru
2. A Buddhist *prang* in Wat Arun, Bangkok, representing Mount Sumeru
3. Hsinbyume Pagoda in Mandalay, Myanmar, representing Mount Sumeru
4. The *meru* of Pura Ulun Danu Bratan is dedicated to Shiva and his consort Parvathi



Depiction of Mount Meru at Jambudweep, a Jain temple in Uttar Pradesh

Jean Filliozat of the Ecole Francaise, a leading western authority on Indian cosmology and astronomy, interpreted the symbolism of the temple. The temple sits on a rectangular base and rises in five levels and is crowned by five main towers. One hundred four smaller towers are distributed over the lower four levels, placed so symmetrically that only 33 can be seen from the center of any side. Thirty-three is the number of gods who dwelt on Mount Meru. Phnom Bakheng's total number of towers is also significant. The center one represents the axis of the world and the 108 smaller ones represent the four lunar phases, each with 27 days. The seven levels of the monument represent the seven heavens and each terrace contains 12 towers which represent the 12-year cycle of Jupiter. According to University of Chicago scholar Paul Wheatley, it is "an astronomical calendar in stone."¹

Following Angkor's rediscovery by the outside world in the mid-19th century, decades passed before archeologists grasped Phnom Bakheng's historical significance. For many years, scholars' consensus view was that the Bayon, the temple located at the center of Angkor Thom city, was the edifice to which the Sdok Kak Thom inscription referred. Later work identified the Bayon as a Buddhist site, built almost three centuries later than originally thought, in the late 12th century, and Phnom Bakheng as King Yasovarman's state temple.

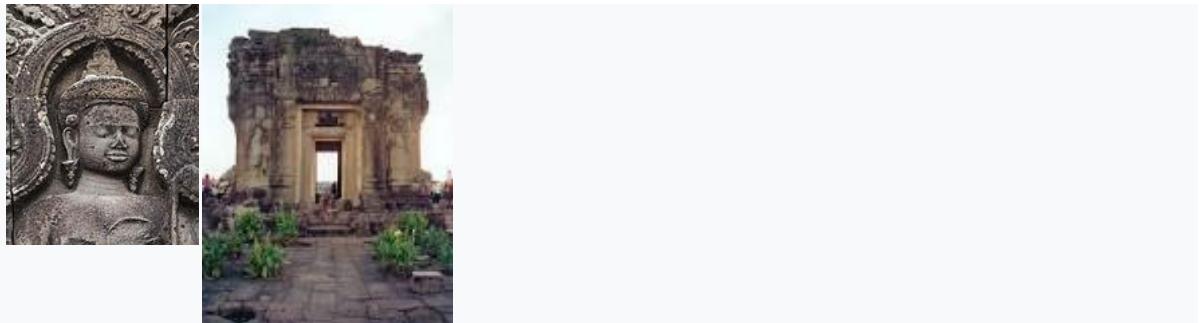
The view of the Angkor Wat from the top of Phnom Bakheng is featured in the movie Tomb Raider (when Lara Croft looks through the binoculars upon arriving in Cambodia).



Phnom Bakheng/Angkor Wat seen from Phnom Bakheng at sunset



1. General view
2. Upper terrace
3. Stone tower and Angkor Wat far afield



Bas-relief in Phnom Bakheng

What was Phnom bakheng used for?

Phnom Bakheng is **a symbolic representation of Mount Meru, home of the Hindu gods**, a status emphasized by the temple's location atop a steep hill 65 m above the surrounding plain. The temple is built in a pyramid form of seven levels, representing the seven heavens. Who built bakheng?



King Yasovarman

It is possible to see: the five towers of Angkor Wat in the west, Phnom Krom to the southwest near the Grand Lake, Phnom Bok in the northeast, Phnom

Kulen in the east, and the West Baray. Phnom Bakheng was built in late ninth to early tenth century by **King Yasovarman dedicated to Siva (Hindi)**.

Related Content



Southeast Asian arts

Southeast Asia has been the crossroads of many peoples who have been contending against each other for centuries. The first to come were the Austronesians (Malayo-Polynesians), sometimes described as Proto-Malays and Deutero-Malays. At one time they occupied the eastern half of mainland Southeast Asia, but later they were pushed toward the south and the islands by the Austroasiatics. At present, peoples of Austronesian origin occupy Malaysia, Indonesia, and the Philippines. There were three main Austroasiatic groups, the Mon, the Khmer, and the Viet-Muong. The Mon were at one time dominant, but they lost their ethnic identity in the 18th century and became absorbed by the Burmese and the Tai; only a few thousand Mon are now found living near the Myanmar-Thailand border. The Khmer from the 9th century to the 15th built a great empire, but much of its territory was lost to its neighbours so that only the small kingdom of Cambodia remains today. The Viet-Muong now occupy Vietnam. A Tibeto-Burmese tribe, the Pyu, founded an empire of city-kingdoms in the Irrawaddy Valley in the early centuries of the Common Era, but the Pyu disappeared, and the Burmese, taking the leadership, founded their kingdom of Pagan and have occupied Burma (now Myanmar) up to the present day. In the 13th century the Tai-Shan lost their kingdom of Nanchao in Yunnan, China, and entered the Mae Nam Chao Phraya Valley to found kingdoms that gradually evolved into the kingdoms of Siam (Thailand) and Laos.

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External influences

In Southeast Asia, winds of change often came as storms. Indian commerce expanded into Southeast Asia in the early centuries of the Common Era and, in spite of its peaceful nature, caused revolutionary changes in the life and culture of the peoples of the region. The Indians would sojourn in the region in small numbers for two or three monsoons only. The success of their commercial venture and the safety of their persons depended entirely on the goodwill of the inhabitants. The Indians brought new ideas and new art traditions. Since these ideas had some affinity with indigenous ideas and art forms, the natives accepted them but were not overwhelmed by an influx of new traditions. The Hindu and Buddhist cultures of the Indians made a tremendous impact and came to form the second layer of culture in Southeast Asia, but the first layer of native ideas and traditions has remained strong to the present day.

Changes often came to Southeast Asia, usually because it possessed a commodity that was in great demand by the rest of the world. The Indians came because they were looking for fresh sources of gold after the Roman imperial source had run dry. In the 15th, 16th, and the 17th centuries, insular Southeast Asia attracted Islamic merchants from India and farther west and later the Portuguese and the Dutch as a rich source of spices. As with the Hindu and Buddhist merchants of the past, the Islamic traders came not as missionaries, though they did spread their religion in the region. The Portuguese came as conquerors and as militant missionaries of their Roman Catholic form of Christianity, and, for those reasons, their cultural traditions were unacceptable to the natives. In the 17th century the Dutch came as conquerors and colonists for whom the attraction was first spices and then coffee, rubber, and petroleum. Since mainland Southeast Asia produced no spices for export, it was less vulnerable to the navies of Portugal and The Netherlands, so the region was not greatly affected by the Muslims, Portuguese, and Dutch. In the 19th century, Britain and France became interested in mainland Southeast Asia as the back door to China and sought to possess it as a colony. By the end of the 19th century, Burma had fallen to Britain, Siam was allowed to retain its independence only with the tacit permission of the two powers, and the rest had fallen to France. When in the mid-20th century the whole of Southeast Asia became free again, European culture and European art forms clearly had made little impact.

10th century to the present

In Cambodia the Khmer empire succeeded to the old territories of Funan-Chenla. About 790 the first major Khmer ruler, Jayavarman II, who was related

to the old Funan royal family, went to Cambodia from the Shailendra court in Java. In 802 he set up a religious capital on a hill at Phnom Kulen. He seems to have called in artists from Champa and Java, thus giving to Khmer art a distinct new impetus. At another site, Sambhupura (Sambor), he built temples with sculpture based upon the old Funan-Chenla tradition. At Amarendrapura, about 800, he built a brick pyramid—an artificial mountain—to support a quincunx of temples.

It was Indravarman I (877–889) who laid the foundations of the fabulous temple complex known as Angkor. His plan was based on a rectangular grid of reservoirs, canals, and irrigation channels to control the waters of the river system. Later kings elaborated this original design to a colossal scale. Indravarman built the first great works of Khmer architecture: the Preah Ko, at Roluos, and at Angkor his temple mountain, the Bakong, ornamented with sculpture. Successive kings built their own temple mountains there, including the Bakheng (c. 893), the Pre Rup (c. 961), the Ta Keo (c. 1000), and the Baphuon (c. 1050–66), culminating in Angkor Wat, built in the first half of the 12th century by Suryavarman II. After a disastrous invasion by the Cham, Jayavarman VII undertook the most ambitious scheme of all, the Mahayana Buddhist Angkor Thom and the Bayon (c. 1200). Thereafter, for a variety of reasons, including conquest by the Thai, no more large-scale work was done by Angkor, and the country became Theravada Buddhist. The modern dynasty adapted remnants of traditional splendour, and the craftspeople of Cambodia remained capable of work in the same vein.

Hindu Javanese art continued to be made under the eastern Javanese dynasties (1222–14th century), although their structures were not nearly as ambitious as the central Javanese works. There are many temple enclosures and volcanic bathing places with modest stone-cut architecture. Some of the stone sculptures from these sites, however, are now world famous. In the 21st century the east Javanese tradition still survives, modified by folk elements, in Bali, to which the east Javanese Hindu kings retreated in the 16th century to maintain their religious independence in the face of Muslim expansion. Muslim monuments in the form of mosques and tombs are found in various parts of Indonesia. They adapt older forms of Indonesian art.

In 1056 the great Burmese king Anawrahta decreed Theravada Buddhism to be the religion of his country, replacing earlier cults. He removed the Mon monks and artists from the capital of the old Mon kingdom in southern Burma, transporting them to his own northern capital, Pagan. There they built a city, with many large brick and stucco temples (pagodas) based on Indian patterns, that remains one of the most impressive sites in Asia. The Mongol invasion of 1287 put a stop to work there.

The Mon city-states of northeast and central Thailand were annexed to the Khmer empire in the 11th century, and Khmer imperial shrines were built

there. After the decline of the Khmer and the Mongol invasion of 1287, a powerful alliance of Thai kings established the first major Thai empire, retaining Theravada Buddhism as the state religion. Thailand was divided into two principal regions, northern and southern, with capitals respectively at Chiang Mai and Ayutthaya, possession of the trade city of Sukhothai being an issue between them. In all the Thai cities, brick and stucco temples were built on variants of Indian and Burmese patterns. Many fine bronze Buddha figures, large and small, were cast in canonical Theravada Buddhist styles. Most of these figures were accommodated in monastery halls built in impermanent materials.

In both Burma and Thailand a very large number of monasteries, usually surrounding one or two principal pagodas, were constructed during the later Middle Ages and into modern times. The major cities of Rangoon (now Yangon), Mandalay, and Bangkok contain the most elaborate examples, although there are many elsewhere. Because the pagodas were repeatedly enlarged and redecorated and the wooden monastic buildings and their many smaller stupas continuously reconstructed and renovated, no absolute chronology has been established for the arts of this epoch.

In Laos and Vietnam, Theravada monasteries, with brick stupas, were similarly built and rebuilt of wood. An outstanding stupa is the That Luang at Vientiane, in Laos, founded in 1566 but much restored in the 18th–19th century. In Vietnam local variants of Chinese styles were adapted during the Middle Ages to the planning and decoration of palaces and of Confucian, Daoist, and Buddhist temples.

Chapter 10

The UPSIDE Down Non Square(Circular) Yogini Temple

One of the exceptions to the square grid is the **Chausath Yogini Temple, Morena**, Gujrath, India also known as Ekattarso Mahadeva Temple, Standing atop an isolated hill of about hundred feet high, this circular temple commands a splendid view of the cultivated fields below. It is one of the few well-preserved Yogini temples in India. The temple is formed by a **circular** wall with 65 chambers, apparently for 64 yoginis and the goddess Devi, and an open mandapa in the centre of a circular courtyard, sacred to Shiva.

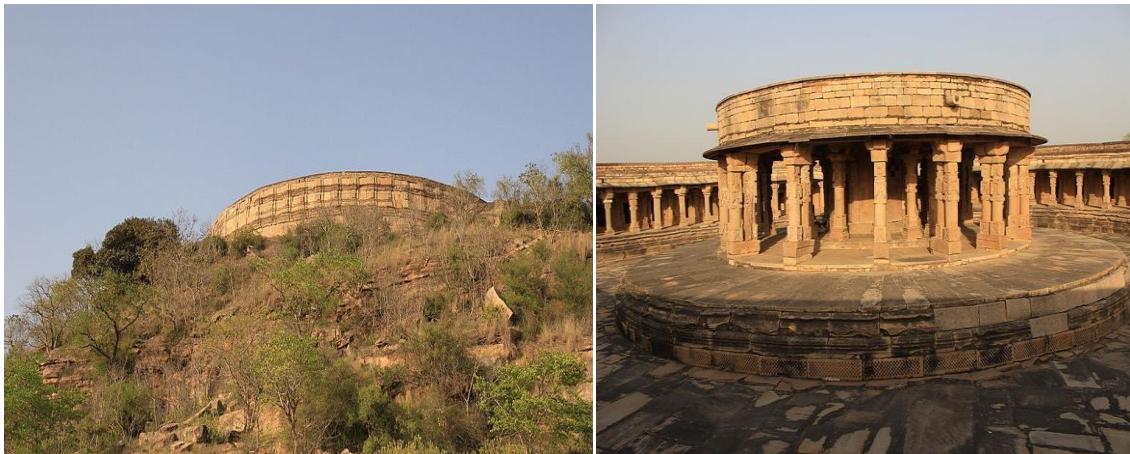
Which is the only circular temple built in India?



Chausath Yogini Temple, circular in plan like other Yogini temples

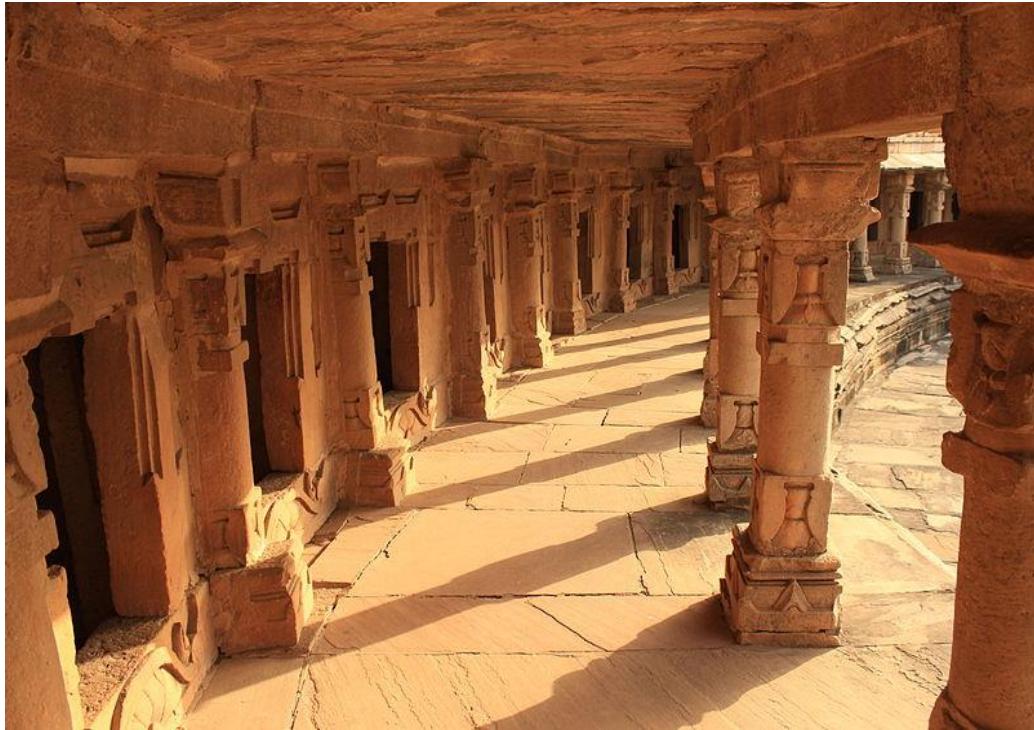


Infographic on significance of Yogini temples, showing design for communion with yoginis, thought to be capable of flight



Central shrine

The **Chausath Yagini Temple, Mitaoli**, also known as **Ekattarso Mahadeva Temple**, is an 11th-century temple in Morena district in the Indian state of Madhya Pradesh. It is one of the few well-preserved Yogini temples in India. The temple is formed by a circular wall with 65 chambers, apparently for 64 yoginis and the goddess Devi, and an open mandapa in the centre of a circular courtyard, sacred to Shiva. The temple is on a hill about 100 feet (30 m) in height; there are 100 steps to climb up to the entrance. It is circular with a radius of 170 feet (52 m), while inside it has 65 small chambers, each with a mandapa which is open and a facia of pilasters and pillars. The roof of the ring of shrines is flat, as is that of the central shrine to Shiva; the circular courtyard is hypaethral, open to the sky, with an open porch as its entrance. The parliament building of India is said to have been based on this temple.



Outer circle

The exterior surface of the outer wall, unlike other Yogini temples which are quite plain outside, was decorated with statues of couples flanked by maidens, mostly now lost or badly damaged.

Each of the chambers around the inside of the perimeter wall now contains an image of Shiva. However, originally these contained 64 Yogini images and probably one image of the great goddess Devi. The temple is therefore known as Chausath Yogini Temple (*Chausath* being the Hindi for "Sixty four"). It is said that the roofs over the 64 chambers and the central shrine had towers or shikharas, as those at the Chausath Yogini Temple, Khajuraho still do, but that these were removed during later modifications. The central shrine's roofing slabs are perforated to allow rainwater to drain through pipes to a large underground tank.

The temple is in the Seismic Zone III region and has survived several earthquakes, seemingly without any serious damage. This fact was cited when the issue of safety from earthquake effect of the circular Parliament House, its design supposedly based on the Mitaoli temple, was debated in the Indian Parliament.

Yogini temples

The Yogini shrines are usually circular enclosures, and they are hypaethral, open to the sky, unlike most Indian temples. This is because they were designed for communion with yoginis, thought to be capable of flight. Inside the circular wall are niches, most often 64, containing statues of female figures, the yoginis. Their bodies are described as beautiful,

but their heads are often those of animals. Yogini temples normally stood somewhat outside the main group of temples, and at the highest point of the site.

The Chausath Yogini temple is in Mitaoli village, Morena district, Madhya Pradesh. According to an inscription dated to 1323 CE (Vikram Samvat 1383) the temple was built by the Kachchhapaghata king Devapala (r. c. 1055 – 1075). It is said that the temple was the venue of providing education in astrology and mathematics based on the transit of the Sun

About the Author--- UDAY DOKRAS

The author has worked for 30 years in the human resources arena in India and abroad. He was Group Vice -President of MZI Group in New Delhi and has anchored Human Relations in Go Air and Hotel Holiday Inn;was General Manager-Health Human Resources at the Lata Mangeshkar Hospital amd Medical college. Is currently Consultant to Gorewada International Zoo,Nagpur and visiting Faculty at the Central Institute of Business Management and Research, Nagpur.

In Sweden he anchored HR in Stadbolaget RENIA, SSSB and advisor to a multi millionaire. He has studied in Nagpur, India where he obtained degrees of Bachelor of Science, Bachelor of Arts(Managerial Economics) and Bachelor of Laws. He has done his Graduate Studies in labour laws from Canada at the Queen's University, Kingston; a MBA from USA, and Doctorate from Stockholm University, Sweden. Apart from that he has done a Management Training Program in Singapore.

A scholar of the Swedish Institute, he has been an Edvard Cassel Fund and Wineroth Fund Awardee.A scholar for the Swedish Institute for 5 years.

In 1984 he was involved with the Comparative Labour Law Project of the University of California, Los Angeles, U.S.A. He was also visiting lecturer there. In 1985 he was invited by the President of Seychelles to do a study of the efficacy of the labour laws of Seychelles.

Author of a book on a Swedish human resource law, his brief life sketch is part of the English study text book of 7 th Class Students in Sweden -“**Studying English. SPOTLIGHT 7**”- and 8th Class students in Iceland - “**SPOTLIGHT 8- Lausnir.**”

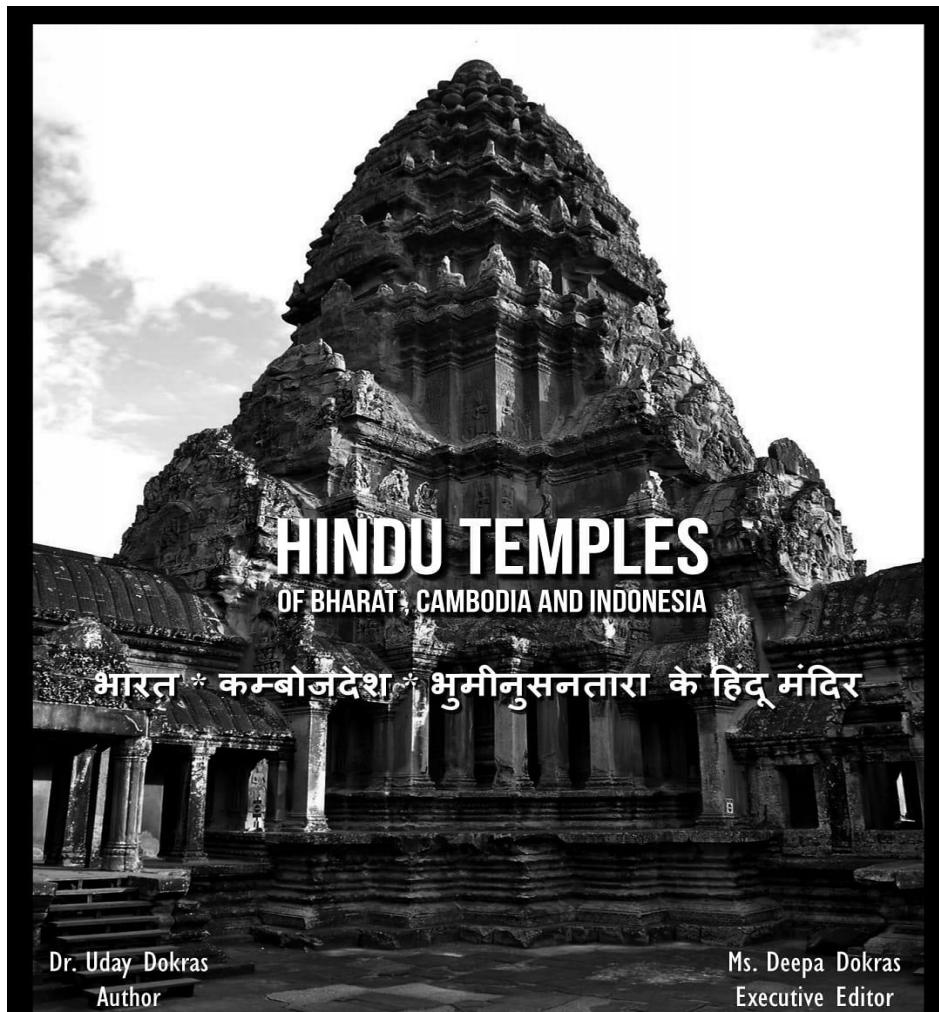
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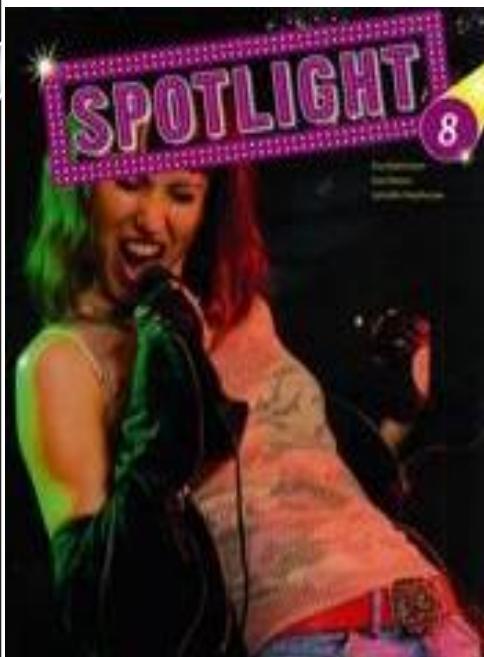
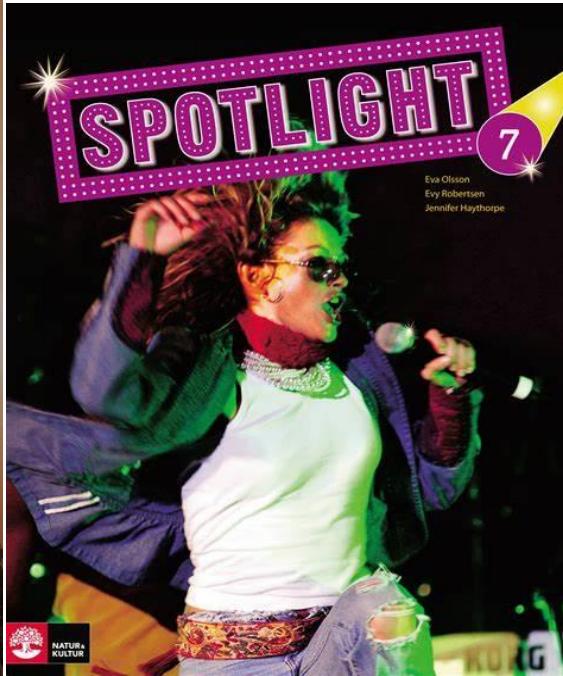
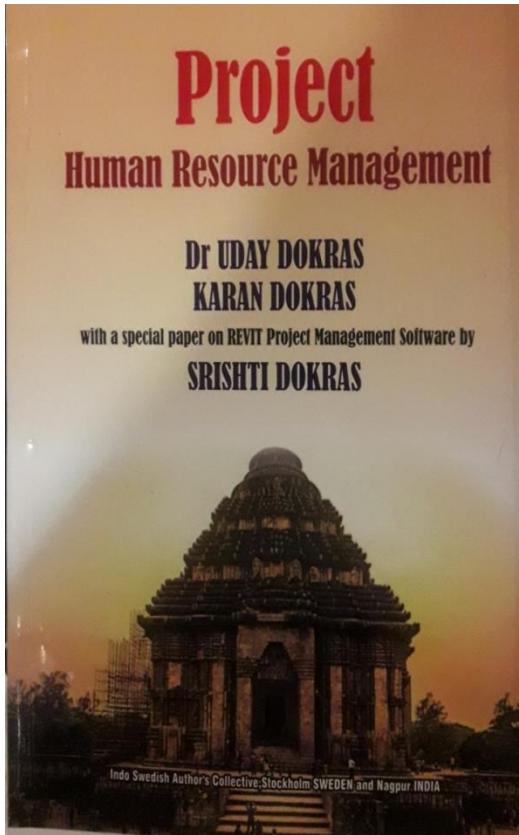
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gimes(May 2010)**

Book on 'Theme Park HR' launched

■ Staff Reporter

THE book 'Theme Park Human Resource Engineering' written by authors Dr Uday Dokras and Mansse Bhandari recently.

Speaking on the occasion Balwant Chawla, Chairman, The Polo Amusement Group, New Delhi And Tashkent, Uzbekistan the chief guest, complemented the writers for choosing such an unique subject and writing this one of a kind book. First in the world on this subject.

This book is a comprehensive guide to manage employees working in all entertainment related businesses such as Malls, Theatres, Multi-plexes, amusement and Theme parks, Casinos, Malls, family entertainment centers etc.

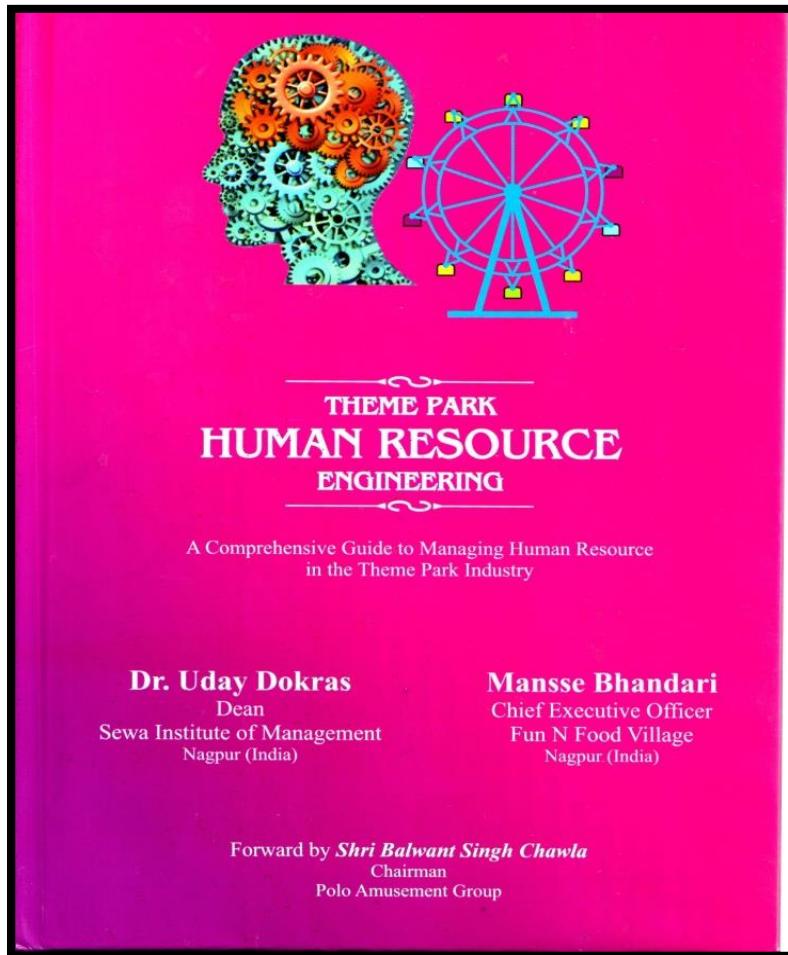
In 11 chapters the authors deal with recruitment, training, discipline, bringing about efficiency and value add to the business using human resource interventions. This is the first book of its kind in the world and is the first time the subject has been tackled. The authors Mansse Bhandari and Dr Uday Dokras have been associated in the Human Resource field for 30 years. Ms. Bhandari is the CEO of Fun 'N' Food Village, Nagpur and was head of Human Resource at the Iceland Park in Dubai for 5 years. Dr Uday Dokras has written 2 other books on HR and was Head HR of GO Airlines in Mumbai. He has been the GM of Hotel Holiday Inn, Mumbai.

This book has been published by the Sewa Institute of Management, a new



Dr Uday Dokras and Mansse Bhandari.

Institute that has taken up the challenge of introducing the Theme Park Management Science to the world.



City author launches book on web from home

■ Staff Reporter

RENNED author Dr Uday Dokras, a prolific writer has penned a 450 page book on the Hindu Temples of Bharat and Cambodia. It is his eighth book and his co-author for this book is Deepa Dokras, a noted historian. He launched the book directly onto the worldwide web from home.



The book deals with how Hinduism reached the far East and the architecture of Hindu temples there and here in our country.

There is very little research done on this subject, claims Dr Uday and Deepa Dokras. Both described the technical aspects of building these temples as well as focuses in detail on temples of Nagpur and others in Cambodia and India.

and Jagenia pointed out.

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ly as possible.

Dr Uday Dokras pens a trilogy on Hinduism

This is 17th book by Dr Uday Dokras and 6th by his daughter

■ Staff Reporter

INDOLOGISTS and Hindologists, Dr Uday Dokras and his daughter Srishti Dokras, an Architect have just released their trilogy on Hindu temples of South-East Asia and Indo China, titled 'Devraja' on the Net.

This is the 17th book by Dr Dokras and sixth by Srishti Dokras. Between the two, they have written 160 research papers on temple construction, Hindu religion in far away nations, design and management available for all to read on researchgate.net.

Spanning 1,200 pages in 3 volumes, the tales are centered on Devraja, the God King of many of these countries who embraced Hinduism and built some of the biggest and most majestic tem-



Dr Uday Dokras and Srishti Dokras

ple monuments in honour of God Vishnu far away in Cambodia and Indonesia.

"How many of us know that Garuda, the giant bird which is Lord Vishnu's vehicle is the national symbol of Thailand, holds a *Trishul* in its hands and name of the national air carrier-is Garuda Airways or that the national flag of Cambodia depicts a Hindu tem-

ple on it - The Angkor Wat. Even fewer know that the Cham people of Vietnam are Brahmins or that the king of Thailand has Hindu priests performing all religious rituals in spite of being a Buddhist - as a national tradition," said Dr Dokras.

Devrajas or God King and Raja Dharma or Hinduism flourished in South-East Asian countries for more than 400 years and constructed the largest Hindu temples in the world. These 3 volumes trace the significance and history of these developments of how the Hindu religion spread to these countries, its expediency in making the Kings of these nations Devrajas, under Hinduism, in order to better lead their people, informed Dr Dokras.

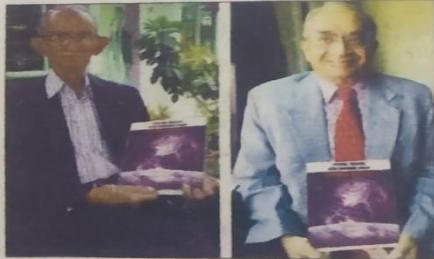
The introduction to the book has been written by famous British Artist Kenny Perry, who is associated with Dr Uday Dokras' books and has contributed original digital art to adorn this picturesque trilogy full of more than 300 art works.

2020/

Prof Deshpande launches two books of Dr Dokras

PROF SA Deshpande, former Head of the Department of Architecture, Visvesvaraya National Institute of Technology and President of the Indian Institute of Architects, e-launched two books of Dr Uday Dokras.

Prof Deshpande appreciated Dr Dokras for writing three books in three months during lockdown. While e-launching the books, he said, "Time will always go by. What distinguishes us is how we use that time for our benefit."



(Left) Prof S A Deshpande and Dr Uday Dokras releasing books.

The two new books by Dr Uday Dokras, who has done PhD from Sweden and is son of former Principal VRCE Vasant Dokras, are about 'Hinduism -- Celestial Mysteries of the Borobudur Temple' and 'Mysteries of the Holy Flower Lotus'. Dr Dokras was once consultant for Gorewada Zoo. Presently, he works for Kettle & Brew Beverages, Pune as online management consultant. Earlier,

on April 31, Dr Dokras had launched the book Hindu Temples of Bharat & Cambodia. Hindu temples and symbolism has existed for several years. It is a fascinating subject that needs to be brought to light for all interested in the mysteries of Hinduism. All of Dr Dokras' 10 books are available gratis for reading on academia.edu and <https://www.yumpu.com/en/human2resources>, stated a press release.

Dr.Uday Dokras

Ph.D (Stockholm, Sweden)
MBA (U.S.A)

Author of 14 books, 150 papers. Find me on Academia.edu and Researchgate.com

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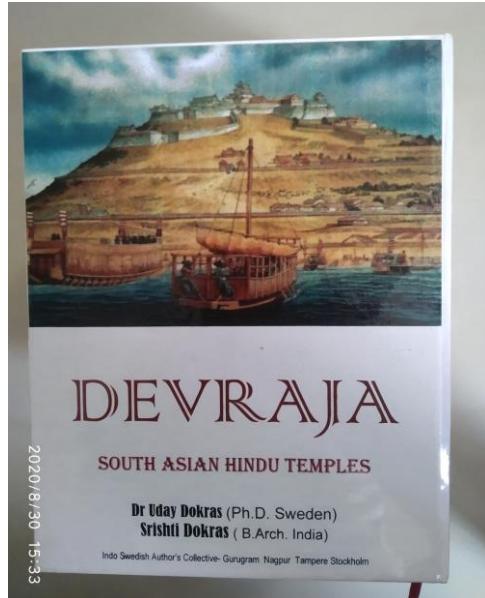
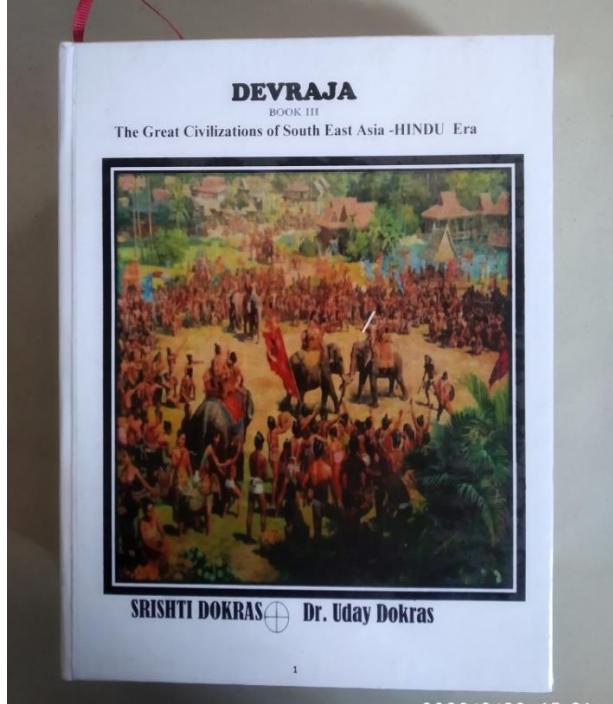
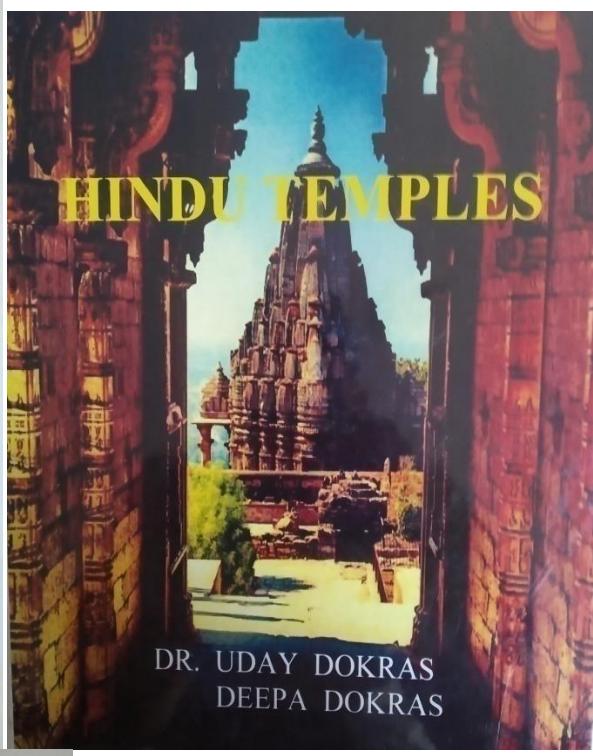
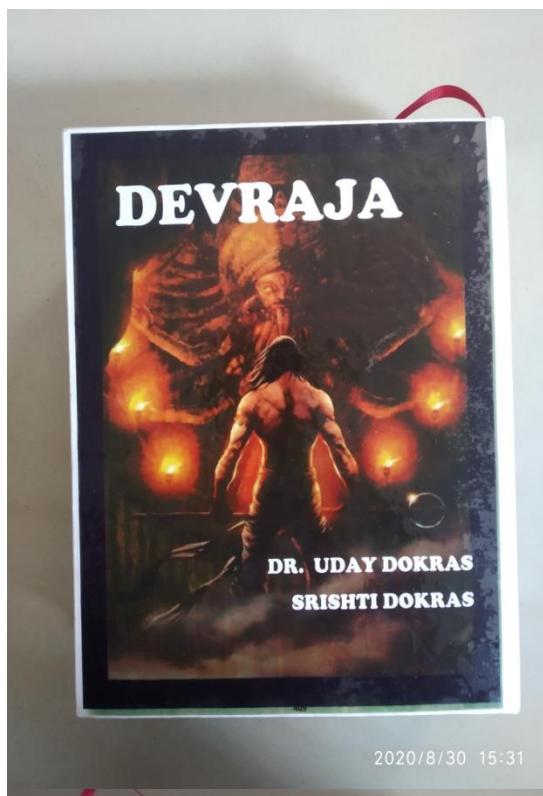
+91 7767990011



udaydokras@gmail.com



Some of my books

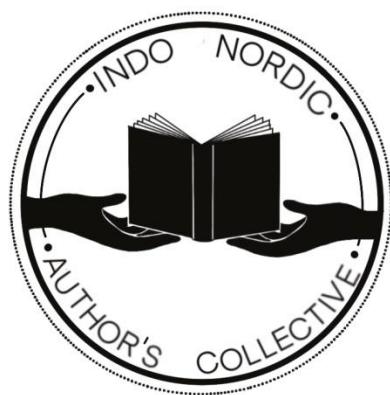


Ancient Maritime Trade of Tamilians and Kalingans

Dr. Uday Dokras

Ph.D. Stockholm University, SWEDEN

Indo Nordic Author's Collective, Stockholm SWEDEN and Nagpur INDIA



SOME OF THE 80 BOOKS BY DR UDAY DOKRAS

Published by
The Indo Swedish Author's Collective Stockholm
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Dr. Uday Dokras

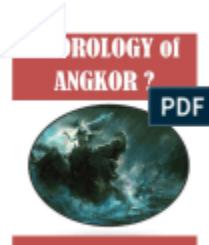


Tamil People as Traders and Voyagers

The Cambodian Trilogy



I.HINDU CAMBODIA



II.HYDROLOGY of ANGKOR

ANGKOR is known as a Hydraulic city- full of canals and river and waterways. It is this water system they say that brought the downfall of this intrinsic kingdom. But is that TRUE?



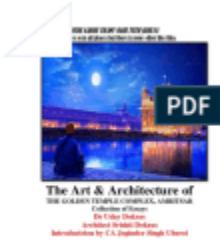
III.ENTER..... THE KINGDOM THAT VANISHED- Angkor



Building Materials of the Hindu Temple

Indo Nordic Author's collective, 2021

In depth study of how Building Materials of the Hindu Temple was used in India, Indonesia and Cambodia and India



The Art & Architecture of THE GOLDEN TEMPLE COMPLEX, AMRITSAR



Mathematics in Temple Designs



Jain ART

Book on Jain Art and Iconography



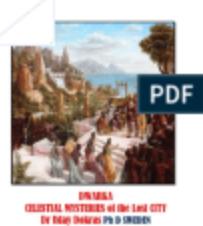
Jain Temples- Part I -Complete Compendium- Book I

A to Z of the architecture, Design,Cosmology,Philosophy of Jain temples in



Jain Temples II

DEVELOPMENT OF THE ARCHITECTURE OF JAIN TEMPLES AND THE
ACTUAL PHOTOGRAPHS(ORIGINAL) OF 3JAIN TEMPLES of Nagpur



DWARKA- CELESTIAL MYSTERIES of the Lost CITY of KRISHNA



TIRUPATI TEMPLE Book part I

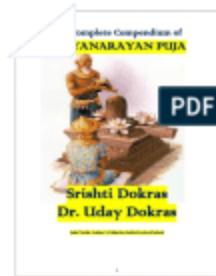


TIRUPATI TemplePart II



Vahanas- the vehicles of Hindu Gods

Vahanas- the vehicles of Hindu Gods. Animals in Hinduism. demi Gods



SATYANARAYAN PUJA-The Complete Compendium

Satyanaaran Puja or 9 Graha Puja(a puja of 9 planets) has been performed by most Hindus not only now but for 1,000's of years.



MAHALAXMI Puja

Hindu Goddess MAHALAXMI Puja



ARCHITECTURE OF PALESTINE



Palestine my Love

Palestine my Love is about the culture arts and crafts of palestine so we recognize it as a entity that is fighting for recognition of not only its legitimacy but also its cultural heritage

QUINTET (5) BOOKS ON MANDALA



Unravelling the MAZE of the MANDALA BOOK I

First part of a two book treatise on MANDALAS. This introductory phase introduces mandalas



Maze of MANDALA BOOK II

Advanced Mandala routine for those who want to know more about MANDALAS



Mandala BOOK III on Nakshatra



BOOK IV MANDALA & ARCHITECTURE

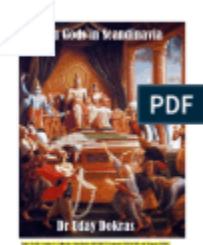
The Use of Mandalas in Building Temples and Modern Buildings



Book V on Mandala of the Oriental Kingdoms



Islamic Architectural Arts of of Imam Ali's 2 Shrines



Hindu Gods in Scandinavia

Did the Hindu Gods originate or live in Scandinavia once? Find out



Book on Divinity and Architecture

What is divinity? How has man tried to harness architecture to create magic in space



Virat Hridaya Padma-sthalam CHIDAMBARAM Temple -Celestial Mysteries

This book is about a mysterious and revered temple built by the Chola Kings of South India 2000 years ago



T2- Temple Tech. A Book

How are Hindu temples built and the technology that follows this craft.
From A to Z Complete Guide.



Rendezvous with Sri RAM Portfolio of Temple Art by Srishti Dokras, Architect Special section on Hindu Foods by Karan Dokras, Product Guru



Best Foot Forward

The story of Footwear through the ages up to COVID times



Hindu Temple Panorama-Celestial Mysteries

A to Z of Temples. A total Panoramic View of design and architecture of Hindu temples in 350 page...



DUOLOGY (2) on JAINISM

Ativir

ATIVIR means Very Brave and is the name given to Lord Mahavir the 24 th Saint(TIRTHANKAR) Contains rare translations of the Dialogue of the Mahavir with his disciples called GHANDHARVAVAD



Vardhaman-वर्धमान

|This book is about Jainism- written by a non-

THE TRILOGY(3) on DEVRAJA The God kings of Khemer

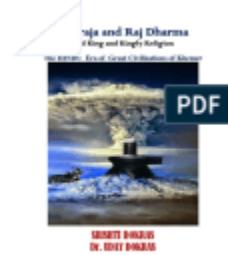


Book I DEVRAJ- The God Kings of Indo China-Cambodia.

This is the first Book of a Trilogy that traces the growth of Hinduism in South East Asia.

BOOK II DEVRAJA- The Great Civilizations of South East Asia -HINDU Era

How Hinduism reached Cambodia and how the Hindu Kings called Devraj
Built these magnificent structures



Devraja BOOK II I Devraja and Raj Dharma God King and Kingly Religion The HINDU Era of Great Civilizations of Khemer

Book 2 of a Trilogy that traces the advent of Hinduism on South East Asian
and Indo-Chinese



Vayu- Man's taming of the winds

Man's conquest of nature spans a million years. How was wind tamed by
him. Here is the full story... more

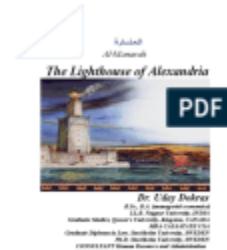


VIMANA Ancient Conquests of Wind

Ancient flying machines of Gods and Men(?) Were they true. Did they really exist. 7000 years ago?



LIGHT HOUSEES In words and pictures



BOOK Architecture of the Lighthouse of Alexandria-BOOK

Indo Swedish Author's Collective, 2020

The lighthouse was built on an island off the coast of Alexandria called Pharos. Its name, legend



Cosmology of lotus

Indo Nordic Author's Collective, 2020

The Lotus is the king of the flower world but few know it as a part of creation. Find out the Cosmology.



Celestial Mysteries of the Borobudur Temple

Borobudur remains a mystery even today. The largest Buddhist Stupa in the world has many unanswered...

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Hindu tempel of India , Cambodia and Indonesia

Hindu Temples dot India, Cambodia and Indonesia

DISRUPTION-Book



Book Architecture Creativity

Creativity and Architecture are linked and go hand in hand. This Book is a culmination of 16 publications that have been put together as a book



Project HR Management

Indo Swedish Author's Collective

PROJECT HUMAN RESOURCE MANAGEMENT/'Dr UDAY DOKRAS The project sphere has not been valued appropriately



Human Resource Engineering in Theme Parks.

by Dr. Uday Dokras and Mansse Bhandari

As theme parks evolve into facilitating for greater thrill seeking audience, the role of human res... more



Health Human Resource Management

Management of Health care workers in hospitals and the human resource practices to be followed in hospitals.

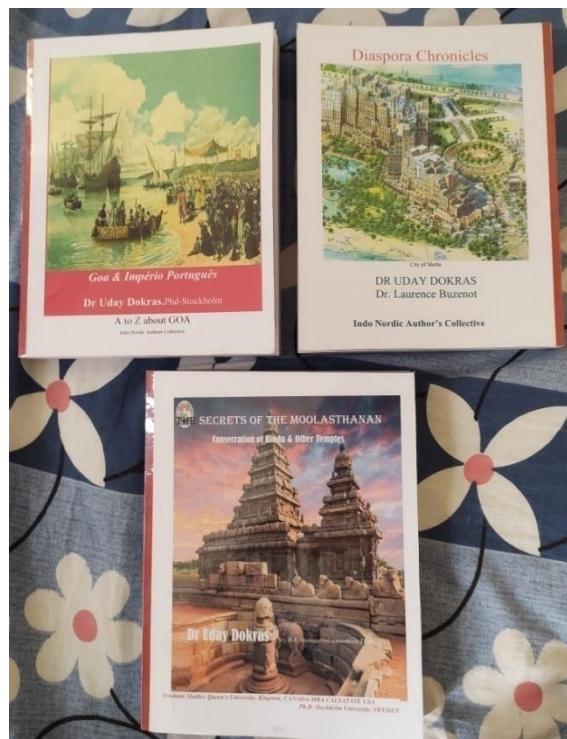


WIN DIET Lose fat-Diet and Exercise Book ONLY BODY SHAPING GUIDE YOU NEED

The Act on Co-determination at Work – an Efficacy study

Thesis of the Author for the degree of Doctor of Law

Stockholm University, SWEDEN 1990



Later Books by the Authors

Nagpur's Prolific and Successful Writer

Dr. Uday Vasant Dokras, son of the later Principal of VNIT Dr. Vasant Dokras, has proved his mettle in writing; making history and India proud. He has written, 80 books since 1990 and 400 Technical and research papers/ articles. His books adorn many international Libraries such as Royal Swedish Library, European Union, Harvard University, Stanford University amongst others-as well as the US Library of Congress, Washington DC.

Recently, he has co-authored a Trilogy on Palestine with Australian Islamic Studies Research author Muhsin Dadarkar who hails from Konkan but settled in Sydney since past 40 years. Muhsin has sold Dr Dokras books to 6 arab countries and will be translated in Arabic. Dr Uday's other books have been translated into Portugese(Brazil) and French. The French editions will be sold on Googlebooks(French).

His expertise on Hindu temples in Bharat and Cambodia is unmatched on which he has written 22 books and 180 papers. His work can be read on [academia.edu](https://www.academia.edu). Dr Uday together with his daughter Srishti who lives in Seattle,USA heads and operate the Indo Nordic Author's Collective- which gives budding author's a chance to get published.

He co-authors with professors from Norway, USA, Reunion (France) and Museum Curators from USA . His brief life sketch is part of the English study text books of 7 th Class Students in Sweden -“Studying English. SPOTLIGHT 7”- and 8 th Class students in Iceland -“SPOTLIGHT 8- Lausnir.”A first for an Indian.

To celebrate 5 lakh readers of his books (Half Million) , Shri Joginder Singh Uberoi our Chartered Accountant felicitated him at the Gondwana Club.

Congratulations To **Dr Uday DOKRAS**

for writing his 80th Book,
400 technical papers.
Translated in 4 languages
with ½ million readers
Worldwide.

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Gondwana Club, Nagpur
by Chartered Accountant
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Compliments from
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Half Million Readers to Dr Uday Dokras' books. Technical Papers and articles

Dr Uday DOKRAS-Srishti DOKRAS



**THE CURIOUS CAPITALS OF THE
GREEKS**

**AND OTHER ESSAYS ON INDO- GRECIAN
ART AND ARCHITECTURE**

